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AN
HISTORICAL MISCELLANY
OF THE
CURIOSITIES AND RARITIES,
IN
NATURE AND ART:
COMPRISING
NEW AND ENTERTAINING DESCRIPTIONS
OF THE MOST SURPRISING
VOLCANOES, CAVERNS, CATARACTS, WHIRLPOOLS, WATER-
FALLS, EARTHQUAKES, THUNDER, LIGHTNING,
AND OTHER WONDERFUL AND STUPENDOUS
PHENOMENA OF NATURE.
FORMING A RICH AND COMPREHENSIVE VIEW OF ALL
THAT IS INTERESTING AND CURIOUS
IN EVERY PART OF THE HABITABLE WORLD.

VOLUME THE FIFTH.

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The Copper-plate Representation of the Setting in of the Monsoons in
India, is to face the Title, by way of Frontispiece to the Volume.



HISTORY

H I S T O R Y

O F T H E

CURIOSITIES AND RARITIES

IN NATURE AND ART.

HISTORY OF SLOW OR SECRET POISONS.

UNDER this name are generally understood all poisons, which can be administered imperceptibly, and which gradually shorten the life of man, like a lingering disease. They were not first discovered, in the last century, in France and Italy, as many believe; but were known to the ancient Greeks and Romans, by whom they were used. We must, however, allow that they were never prepared with more art, at any period, or in any country, or employed oftener and with more success, than they were in these countries, and at that time. If it be true that they can be prepared in such a manner as to occasion death at a certain period previously determined, or as that the person to whom they are given will die within a certain time limited, it must be confessed that the ancient poisoners have been far exceeded by the modern. But this advantage will be considered as scarcely possible, when one reflects upon the many variable circumstances which have an influence on the operation of medicines and poison; and it has often happened, that a company have swallowed the same poison, at the same time, and in the same quantity, some of whom have died sooner and some later, while some have survived. Thus died Pope Alexander VI. in the year 1503, and Cesar Borgia recovered without any loss of health, though, by the bottles being changed through mistake, he drank of the poison that had been prepared for the other guests alone. At any rate, we are of opinion that the celebrated Tophania, when she engaged to free wives from disagreeable husbands within stated weeks and days, must have had certain and very accurate information respecting their constitution and manner of living, or, as the physicians say, their idiosyncrasy.

Some physicians have doubted respecting secret poison; and others have only denied that its effects can with certainty be regulated to a fixed time. We agree in opinion with the latter; but the former can be confuted by many examples both of ancient and modern times: for that the ancients were acquainted with this kind of poison, can be proved by the testimony of Plutarch, Quintilian, and other respectable authors. We are told by Plutarch, that a slow poison, which occasioned heat, a cough, spitting of blood, a consumption, and a weakness of intellect, was administered to Aratus of Sicyon; and Quintilian, in his declamations, speaks of this poison in such a manner as proves that it must then have been well known. It cannot be said that such an invention was too great for that period; or that it required a greater skill in chemistry than any one then possessed; for the Indians, in America, are acquainted with a most perfect poison of this kind, and can employ it with so much skill that the person to whom it is given cannot guard against the treachery, even with the utmost precaution; but infallibly dies, though in a lingering manner, often after the expiration of some years. With the poison of the Indians, however, the ancients could not be acquainted, as it is prepared from a plant not known in Europe before the discovery of America. Kalm, in his Travels, does not name it: and in that he has done right; for, as the plant is now to be found every where, no government could guard against a misapplication of it were it publicly known.

Theophrastus speaks of a poison which could be moderated in such a manner as to have effect in two or three months, or at the end of a year or two years; and he remarks that the death, the more lingering it was, became the more miserable. This poison was prepared from aconitum, a plant which, on that account, people were forbidden to have in their possession, under pain of capital punishment. They say a poison can be prepared from aconite (aconitum) so as to occasion death within a certain period, such as two, three, or six, months, a year, and even sometimes two years. Those, we are told, whose constitutions are able to hold out longest, die in the greatest misery; for the body is gradually consumed, and must perish by continual wasting. Those die easiest who die speedily. No remedy has been found out for this poison. He relates also, that Thrasyas had discovered a method of preparing from other plants a poison which, given in small doses of a dram, occasioned an easy but certain death, without any pain, and which could be kept back for a long time without causing weakness or corruption. This Thrasyas, whose scholar Alexias carried the art still farther, was a native of Mantinea, a city in Arcadia, and is celebrated by Theophrastus on account of his abilities, and particularly his knowledge of botany; but those are mistaken who ascribe to him the discovery of secret poison.

This poison was much used at Rome about two hundred years before the Christian æra. As several persons of distinction died the same year at that period, and of the like distemper, an enquiry being made into the cause, a maid servant gave evidence against some ladies of the first families, who, she said, prepared and distributed poison; and above an hundred and fifty of them were convicted and punished. As so many had learned this destructive art, it could not be suppressed; and we find sufficient proofs in the Roman history
that

that it was continually preserved. Sejanus caused such a secret poison to be administered by an eunuch to Drusus, who gradually declined afterwards as by a consumptive disorder, and then died.—Agrippina, being desirous of getting rid of Claudius, but not daring to dispatch him suddenly, and yet wishing not to leave him sufficient time to make new regulations respecting the succession to the throne, she made choice of a poison which should deprive him of his reason, and gradually consume him. This she caused to be prepared by an expert poisoner, named Locusta, who had been condemned to death for her infamous actions, but saved that she might be employed as a state-engine. The poison was given to the emperor in a dish of mushrooms; but as, on account of his irregular manner of living, it did not produce the desired effect, it was assisted by some of a stronger nature. This Locusta prepared also the poison with which Nero dispatched Britannicus, the son of Agrippina, whom his father Claudius wished to succeed him on the throne. As this poison occasioned only a dysentery, and was too slow in its operation, the emperor compelled Locusta, by blows, and by threatening her with death, to prepare, in his presence, one more powerful: it was first tried on a kid; but, as the animal did not die till the end of five hours, she boiled it a little longer, when it instantaneously killed a pig to which it was given; and this poison dispatched Britannicus as soon as he had tasted it. For this service the emperor pardoned Locusta, rewarded her liberally, and gave her pupils whom she was to instruct in her art, in order that it might not be lost.

The art of preparing this poison must have been well understood also at Carthage. When M. Attilus Regulus, the Roman general, who had been taken by the Carthaginians, was sent to Rome to propose to the senate that the Carthaginian prisoners might be restored in exchange for him, he prevented this negotiation, because he knew that a poison had been administered to him by which the state would soon be deprived of his services. He returned, therefore, to Carthage, in compliance with the promise he had made to the enemy, who put him to death with the most exquisite torture.

All these poisons were prepared from plants, particularly aconite, hemlock, and poppy, or extracted from animal substances. Among those made from the latter, none is more remarkable than that supplied by the sea-hare, *lepus marinus*, with which, as Philostratus says, Titus was dispatched by Domitian. Without here attempting to define the substances employed by the ancients to compose their poisons, we shall only observe, that the *lepus marinus*, the terrible effects of which are expressly mentioned by Dioscorides, Galen, Nicander, Ætius, Ælian, Pliny, and others, is that animal called, at present, in the Linnean System, *aplysia depilans*, as Rondelet conjectured, and has been since fully proved by Bohadsch. This animal poison, however, seems to have been seldom used, as it easily betrays itself by some peculiar symptoms. It appears that it was not known to Aristotle, at least he makes no mention of it. With the far stronger, and now common, mineral poisons, the ancients were not acquainted; for their arsenic was what we call orpiment, and not that pernicious metallic calx which formed the principal ingredient of those secret poisons which, in latter times, were in France and Italy brought to a diabolical perfection.

No one was ever more infamous by this art than Tophana, or Toffania, a woman who resided first at Palermo, and afterwards at Naples. She sold those drops, which from her acquired the name of *aqua Tophania*, *aqua della Toffana*, and which were called also *acquetta di Napoli*, or only *acquetta*; but she distributed her preparation by way of charity to such wives as wished to have other husbands. From four to six drops were sufficient to destroy a man; and it was asserted that the dose could be so proportioned as to operate in a certain time. As she was watched by the government, she fled to an ecclesiastical asylum; and, when Keyser was at Naples in 1730, she was then still living, because no one could, or was willing to, take away her life, while under that protection. At that time she was visited by many strangers out of curiosity.

In Labat's travels through Italy we also find some information which may serve, still farther, to illustrate the history of Tophania. She distributed her poison in small glass phials, with this inscription, *Manna of St. Nicholas of Bari*, and ornamented with the image of the saint. A miraculous oil, employed by folly in the cure of many diseases, drops from the tomb of that saint which is shewn at Bari in the Neapolitan territory, and on this account it is dispersed in great abundance under the like name; it was therefore the best appellation which Tophania could give to her poison, because the reputed sanctity of it prevented the custom-house officers from examining it too closely. When the viceroy was informed of this, which was about the year 1709, Tophania fled from one convent to another, but was at length seized and thrown into prison. The clergy, always actuated by piety and the meek spirit of the gospel, raised a violent outcry on account of this violation of ecclesiastical freedom, and endeavoured to excite the people to insurrection in favour of this wretch! but they were soon appeased on a report being spread that Tophania had confessed she had poisoned all the springs in the city. Being put to the rack, she acknowledged her wickedness; named those who had protected her, and who were immediately dragged from churches and monasteries, (to the great regret of the clergy again;) and declared that, the day before she had absconded, she had sent two boxes of her manna to Rome, where it was found in the custom-house, but she did not accuse any one of having ordered it. She was afterwards strangled; and, to mitigate the wrath of the archbishop for having forced so holy a person from so sacred a place, her body was thrown, at night, into the area of the convent from which she had been taken. Tophania, however, was not the only person at Naples who understood the making of this poison; for Keyser says, that, at the time he was there, it was still secretly prepared, and much employed.

In the year 1659, under the government of Pope Alexander VII. it was observed at Rome, that many young married women became widows, and that many husbands died when they became disagreeable to their wives. Several of the clergy declared also, that for some time past various persons had acknowledged at confession, that they had been guilty of poisoning. As the government employed the utmost vigilance to discover these poisoners, a society of young wives, whose president appeared to be an old woman who pretended to foretel future events, and who had often predicted very exactly the death of many persons, became suspected. To convict her of
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the crime, a crafty woman, given out to be a person of considerable distinction, was sent to her, who pretended that she wished to obtain her confidence, and to procure some of her drops for a cruel and tyrannical husband. The whole society were by this stratagem arrested; and all of them, except the fortuneteller, whose name was Hieronyma Spara, confessed before they were put to the torture.—“Where now,” cried she, “are the Roman princes, knights, and barons, who on so many occasions promised me their protection! Where are the ladies who assured me of their friendship! Where are my children whom I have placed in so distinguished situations!” In order to deter others from committing the like crime, one Gratiola, Spara’s assistant, three other women, and the obstinate Spara herself, who still entertained hopes of assistance till the last moment, were hanged in the presence of innumerable spectators. Some months after, several more women were executed in the same manner; some were whipt, and others were banished from the country. Notwithstanding these punishments, the effects of this inveterate wickedness have been from time to time remarked. Le Bret, to whom we are indebted for the above account, says, that Spara was a Sicilian, and acquired her knowledge from Tophania at Palermo. If that be true, the latter must have been early initiated in villany, and must have become when very young a teacher of her infamous art. Keyser calls her a little old woman.

The art of poisoning never excited more attention in France than about the year 1670. Mary Margaret d’Aubray, daughter of the Lieutenant-civil Dreux d’Aubray, was, in the year 1651, married to the Marquis de Brinvillier, son of Gobelin president of the chamber of accounts, who had a yearly income of thirty thousand livres, and to whom she brought a portion of two hundred thousand. He was mestre de camp of the regiment of Normandy, and during the course of his campaigns became acquainted with one Godin de Sainte Croix, a young man of a distinguished family, who served as a captain of cavalry in the regiment of Trassy. This young officer, who was then a needy adventurer, became a constant visitor of the marquis, and in a short time paid his addresses to the marchioness, who lost her husband after she had helped to dissipate his large fortune, and was thus enabled to enjoy her amours in greater freedom. Her indecent conduct, however, gave so much uneasiness to her father, that he procured a lettre de cachet, had Sainte Croix arrested, while in a carriage by her side, and thrown into the Bastille. Sainte Croix there got acquainted with an Italian named Exili, who understood the art of preparing poison, and from whom he learned it. As they were both set at liberty after a year’s imprisonment, Sainte Croix kept Exili with him until he became perfectly master of the art, in which he afterwards instructed the marchioness, in order that she might employ it in bettering the circumstances of both. When she had acquired the principles of the art, she assumed the appearance of a nun, distributed food to the poor, nursed the sick in the Hôtel-Dieu, and gave them medicines, but only for the purpose of trying the strength of her poison undetected on these helpless wretches. It was said in Paris, by way of satire, that no young physician, in introducing himself to practice, had ever so speedily filled a church-yard as Brinvillier. By the force of money, she prevailed on Sainte Croix’s servant, called La Chauffée, to administer
poison

poison to her father, into whose service she got him introduced, and also to her brother, who was a counsellor of the parliament, and resided at his father's house. To the former the poison was given ten times before he died; the son died sooner; but the daughter, *Mademoiselle d'Aubray*, the marchioness could not poison, because, perhaps, she was too much on her guard; for a suspicion soon arose that the father and son had been poisoned, and the bodies were opened. She would, however, have escaped, had not Providence brought to light the villany.

Sainte Croix, when preparing poison, was accustomed to wear a glass mask; but, as this once happened to drop off by accident, he was suffocated, and found dead in his laboratory. Government caused the effects of this man, who had no family, to be examined, and a list of them to be made out. On searching them, there was found a small box, to which *Sainte Croix* had affixed a written request, that after his death it might be delivered to the *Marchioness de Brinvillier*, or, in case she should not be living, that it might be burnt. This request was as follows: "I humbly beg that those into whose hands this box may fall, will do me the favour to deliver it into the hands only of the *Marchioness de Brinvillier*, who resides in the street *Neuve Saint Paul*, as every thing it contains concerns her, and belongs to her alone, and as, besides, there is nothing in it that can be of use to any person except her; and, in case she shall be dead before me, to burn it, and every thing it contains, without opening or altering any thing; and, in order that no one may plead ignorance, I swear by the God whom I adore, and by all that is most sacred, that I advance nothing but what is true. And if my intentions, just and reasonable as they are, be thwarted in this point, I charge their consciences with it, both in this world and the next, in order that I may unload mine, protesting that this is my last will. Done at Paris, this 25th of May in the afternoon, 1672.

DE SAINTE CROIX."

Nothing could be a greater inducement to have it opened than this singular petition; and that being done, there was found in it a great abundance of poisons of every kind, with labels on which their effects, proved by experiments made on animals, were marked. When the marchioness heard of the death of her lover and instructor, she was desirous to have the casket, and endeavoured to get possession of it, by bribing the officers of justice; but, as she failed in this, she quitted the kingdom. *La Chaussée*, however, continued at Paris, laid claim to the property of *Sainte Croix*, was seized and imprisoned, confessed more acts of villany than were suspected, and was, in consequence, broke alive on the wheel in 1673.

A very active officer of justice, named *Desgrais*, was dispatched in search of the *Marchioness de Brinvillier*, who was found in a convent at *Liege*, to which she had fled from England. To entice her from this privileged place, which folly had consecrated for the protection of vice, *Desgrais* assumed the dress of an abbé, found means to get acquainted with her, acted the part of a lover, and, having engaged her to go out on an excursion of pleasure, arrested her. Among her effects at the convent, there was found a confession, written by her own hand, which contained a complete catalogue of her crimes. She there acknowledged that she had set fire to houses, and that she had occasioned the death of more persons than any one

ever suspected. She remarked also, that she had continued a virgin only till the seventh year of her age. Notwithstanding all the craft which she employed to escape, she was conveyed to Paris, where she at first denied every thing; and, when in prison, she played piquet to pass away the time. She was, however, convicted, brought to a confession of her enormities, became a convert, as her confessor termed it, and went with much firmness to the place of execution, on the 16th of July, 1676; where, when she beheld the multitude of the spectators, she exclaimed in a contemptuous manner, "You have come to see a fine spectacle!" She was beheaded, and afterwards burned; a punishment too mild for such an offender. Martiniere says that she was burned alive, together with all the papers respecting her trial. The latter is improbable, and the former certainly false, notwithstanding the account given in the *Encyclopédie*.

The following description of Brinvillier may perhaps be of use to our physiognomists: "In order to satisfy the curiosity of those who may be desirous of knowing if such a celebrated criminal partook of the beauties of her sex, I shall observe, that nature had not been sparing of them to the marchioness; her features were exceedingly regular, and the form of her face, which was round, was very graceful. This beautiful outside concealed a heart extremely black. Nothing proves more that *metoposcopy*, or the science of physiognomy, is false; for this lady had that serene and tranquil air which announces virtue."

Among a number of persons suspected of being concerned in this affair, was a German apothecary, named Glafer, who, on account of his knowledge in Chemistry, was intimate with Exili and Sainte Croix. From him they had both procured the materials which they used, and he was some years confined in the Bastile; but, the charge against him being more minutely investigated, he was declared innocent, and set at liberty. He was the author of a treatise of chemistry, printed at Paris in 1667, and reprinted afterwards at Brussels in 1676, and at Lyons in 1679.

By the execution of this French Medea, the practice of poisoning was not suppressed; many persons died from time to time with very suspicious circumstances; and the archbishop was informed, from different parishes, that this crime was still confessed, and that traces of it were remarked both in high and in low families. For watching, searching after, and punishing, poisoners, a particular court, called the *Chambre de poison*, or *Chambre ardente*, was at length established in 1679. This court, besides other persons, detected two women, named La Vigoreux and La Voisin, who carried on a great traffic in poisons. The latter was a midwife. Both of them pretended to foretel future events, to call up ghosts, and to teach the art of finding hidden treasures, and of recovering lost or stolen goods. They also distributed philtres and sold secret poison to such persons as they knew they could depend upon, and who wished to employ them either to get rid of bad husbands, or recover lost lovers. Female curiosity induced several ladies of the first rank, and even belonging to the court, to visit these women, particularly La Voisin, and who, without thinking of poison, only wished to know how soon a husband, lover, the king, or his mistress, would die. In the possession of La Voisin was found a list of all those who had given themselves up to her imposition, who were arrested and carried before the

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3 HISTORY OF SLOW OR SECRET POISONS.

the above-mentioned court, which, without following the usual course of justice, detected secret crimes by means of spies, tried them privately, and began to imitate the proceedings of the holy inquisition. In this list were found the distinguished names of the Countess of Soissons, her sister the Duchess de Bouillon, and Marshal de Luxembourg. The first fled to Flanders to avoid the severity and disgrace of imprisonment; the second saved herself by the help of her friends; and the last, after he had been some months in the Bastille, and had undergone a strict examination, by which he almost lost his reputation, was set at liberty as innocent. Thus did the cruel Louvois, the war minister, and the Marchioness de Montespan, ruin those who opposed their measures. La Vigoreux and La Voisin were burnt alive, on the 22d of February 1680, after their hands had been bored through with a red-hot iron, and cut off. Several persons of ordinary rank were punished by the common hangman; those of higher rank, after they had been declared by this tribunal not guilty, were set at liberty; and in 1680 an end was put to the *Chambre ardente*, which in reality was a political inquisition.

It is certain that, notwithstanding such punishments, like crimes have given occasion to unjust succession both in Italy and in France, and that attempts have been made for the same purpose even in the northern kingdoms. It is known, that in Denmark Count Corfitz de Ulfeld was guilty, though it was not proved, of having intended to give the king a poison, which should gradually destroy him like a lethargy. Charles XI. also, king of Sweden, died by the effects of such a poison. Having ruined several noble families by seizing on their property, and having after that made a journey to Torneo, he fell into a consumptive disorder, which no medicine could cure. One day he asked his physician, in a very earnest manner, what was the cause of his illness? The physician replied, "Your majesty has been loaded with too many maledictions." "Yes," returned the king, "I wish to God that the reduction of the nobility's estates had not taken place, and that I had never undertaken a journey to Torneo!" After his death his intestines were found to be full of small ulcers.

The oftener poisoning in this manner happens, the more it is to be wished that preventatives and antidotes were found out, and that the symptoms were ascertained; but this is hardly possible as long as it is not known of what the poison properly consists. Governments, however, have wisely endeavoured to conceal the receipts, by suppressing the criminal procedures. Pope Alexander VII. caused them to be shut up in the castle of St. Angelo; in France, it is said, they were burned together with the criminals; in Naples only, the same precaution was not taken. We do not know that observations on the bodies of persons destroyed by slow poison have been ever published; for what Pitaval says on that subject is not sufficient. People talk of powders and pills, but the greater part of this kind of poison appears to be a clear insipid water, and that prepared by Toffania never once betrayed itself by any particular effects on the body. The sale of aqua fortis was a long time forbidden at Rome, because it was considered as the principal ingredient; but that is very improbable. At Paris it was once believed that succession-powder consisted of diamond-dust pounded exceedingly fine. Without assenting to this idea, one may contradict Voltaire, who conceives that
diamond-

diamond-dust is not more prejudicial than powder of coral. It may be rather compared to that fine sand which is rubbed off from our mill-stones, and which we should consider and guard against, as a secret poison, were we not highly negligent and careless of our health in the use of food. In the casket of Sainte Croix were found sublimate, opium, regulus of antimony, vitriol; and a large quantity of poison ready prepared, the principal ingredients of which the physicians were not able to distinguish. Many have affirmed, that sugar of lead was the chief ingredient; but the consequences of the poison did not seem to indicate the use of that metal. For some years past a harmless plant, which is only somewhat bitter and astringent, the *cymbalaria*, that grows on old walls, has been loaded with the opprobrium of producing this slow poison, while at the same time it has been celebrated by others on account of its medicinal properties; but it is, perhaps, not powerful enough to do either mischief or good; and, it is probable that it has been added to poisons either through ignorance, or to conceal other ingredients; for the Emperor Charles VI. who was king of the Two Sicilies at the time when Toffania was arrested, told his physician Garelli, who communicated the same in a letter to the celebrated Hoffman, in 1718 or 1719, that the poison of that Italian Circe was composed of an arsenical calx, dissolved in *aqua cymbalariae*, and which I suppose was rendered stronger and more difficult to be detected by a salt that may be readily guessed. It is dreadful to think, that this secret poison is administered as a febrifuge by ignorant or unprincipled physicians, quacks, and old women. It drives off obstinate fevers; it is true; but it is equally certain that it hastens death: it is, therefore a cure, which is far worse than the disease, and against which governments and physicians cannot exclaim too severely. Let us here be permitted to recommend to the latter the ideas of Mr. Mohsen on this subject, and to chemists the means Mr. Bell employed to analyse these stygian drops. It was remarked at Rome, by accident, that lemon juice and the acid of lemons are, in some measure, counter poisons; and a physician named Paul Branchalotti, respecting whom we can find no information, wrote a book expressly on this antidote to these drops, according to the account of Keysser, who however adds, "Every thing hitherto found out, supposes that one has taken the drops only for a short time, or that one has had an opportunity to be upon one's guard when suspicious circumstances occurred, and to discover the threatened danger."

It seems to be almost certain that the poisons prepared by Toffania and Brinvillier were arsenical mixtures, or, as Dr. Hahneman rightly conjectures, arsenical neutral salts. Loss of appetite, faintness, gnawing pains in the stomach, loss of strength without any visible cause, a continual indisposition, followed by a wasting of the lungs, a slow fever, &c. are all symptoms which seem to announce that dangerous semi-metal. The opinion, however, that it was composed of opium and cantharides has, in latter times, received so many confirmations, that one is almost induced to believe that there are more kinds than one of this stygian water. The information given by the Abbé Gagliani seems to carry too much weight with it to be denied:—On the 20th of December, 1765, died the dauphin, father of the present king, and in 1767 died the dauphin. It was a public report that they were both dispatched by secret poison: and the

gradual decline of their health, the other circumstances which accompanied their illness, and the cabals which then existed at court, make this at least not improbable. Many private anecdotes respecting these events may be found in a book entitled *L'Espion dévalisé*, Lond. 1782. In page 61 it is said, that, on account of the suspicions then entertained, it was wished that information might be procured respecting secret poison, and the methods of preparing it; and, that the Abbé Gagliani, well known as a writer, has given the following:—"It is certain that in Europe the preparation of these drugs renders them pernicious and mortal. For example, at Naples the mixture of opium and cantharides, in known doses, is a slow poison, the surest of all, and the more infallible as one cannot mistrust it. At first it is given in small doses, that its effects may be insensible. In Italy we call it *aqua di Tufania*, Tufania water. No one can avoid its attacks, because the liquor obtained from that composition is as limpid as rock water, and without taste. Its effects are slow and almost imperceptible: a few drops of it only are poured into tea, chocolate, or soup, &c. There is not a lady at Naples who has not some of it lying carelessly on her toilette with her smelling-bottles. She alone knows the phial, and can distinguish it. Even the waiting woman, who is her confidante, is not in the secret, and takes this phial for distilled water, or water obtained by precipitation, which is the purest, and which is used to moderate perfumes when they are too strong.

"The effects of this poison are very simple. A general indisposition is at first felt in the whole frame. The physician examines you, and perceiving no symptoms of disease, either external or internal, no obstructions, no collection of humours, no inflammations, orders detergents, regimen, and evacuation. The dose of poison is then doubled, and the same indisposition continues without being more characterised.—The physician, who can see in this nothing extraordinary, ascribes the state of the patient to viscous and peccant humours, which have not been sufficiently carried off by the first evacuation. He orders a second—a third dose—a third evacuation—a fourth dose. The physician then sees that the disease has escaped him, that he has mistaken it, and that the cause of it cannot be discovered but by changing the regimen. He orders the waters, &c. In a word, the noble parts lose their tone, become relaxed and affected, and the lungs particularly, as the most delicate of all, and one of those most employed in the functions of the animal œconomy. The first illness then carries you off; because the critical accumulation settles always on the weak part, and consequently on the lobes of the lungs; the pus there fixes itself, and the disease becomes incurable. By this method they follow one as long as they choose for months, and for years. Robust constitutions resist a long time. In short, it is not the liquor alone that kills, it is rather the different remedies, which alter and then destroy the temperament, exhaust the strength, extenuate and render one incapable of supporting the first indisposition that comes."

BUONAPARTE'S EXPEDITION. Continued from vol. iv. p. 293.

BUONAPARTE is not dead, as reported. The following are the circumstances of the insurrection in which he was supposed to have perished.

Buonaparte

Buonaparte wished to impose a tax of ten piastres on every house in Cairo, to compel the inhabitants to wear the national cockade, and to ornament the doors of their houses with it. He had for these purposes convened a council, and had sent thither one of his principal generals with a suite of sixty persons. While this general attempted to convince the people of the propriety of these measures, a common man, a native of Barbary, shot him with a pistol, and all his retinue were massacred. The populace then massacred all the French in the houses and streets, and set fire to the buildings in which they took refuge and defended themselves. About five hundred Frenchmen, who were assembled at Azab-Kerbello, were attacked and cut to pieces.

At the same time, Aga Mustapha, Kinja of Abubekir, the *ci-devant* Pacha of Cairo, collected all the Turks, and put himself at their head, with all the sheiks and the hulems. The castle was forced, two other generals under Buonaparte were killed in the engagement, the garrison was put to the sword, and all the artillery and ammunition fell into the hands of the Turks. Buonaparte, who had retired to Boulack, attempted by his usual artifices to repair this disaster. He proposed conciliatory terms, and subscribed to the offences which had been committed; but the only answer made to this conduct by the Mussulmen was a discharge of artillery from the castle.

The following dispatch relative to the insurrection is copied from the *Redacteur*.

"Towards the middle of Vendemiaire (beginning of October) measures of security induced the general in chief to arm the Europeans formerly established at Cairo, as well as all the French who composed the military administrations, and others who followed the army.—Informed that a sedition was secretly planned, the general tried to prevent its evil effects, but his endeavours were unsuccessful.

On the 30th of Vendemiaire (Oct. 21), General Dupuy, commandant of the garrison of Cairo, being informed that a mob was forming at the grand mosque, mounted his horse, and went at the head of the 12th dragoons to disperse it. The Turks in the city said, that the discontent occasioned by the imposts was the sole cause of the tumult. General Dupuy arrived at the grand mosque, and tried to disperse the mob, which increased every moment; but he found them refractory, and soon experienced their rage. He endeavoured to repel them by force, but he and his escort were assailed by a great multitude, and he was mortally wounded in two places. Some dragoons also fell, and the others conducted the general to his quarters, where he died some hours after.

This was the signal of the insurrection, and from that moment the Turks proceeded in crowds to the grand mosque, where they fortified themselves, armed with lances, sharp-pointed stakes, and some fire-arms. Their plot was well laid. They did not confine themselves to assembling in a great number at the grand mosque; but each private mosque formed a fortress for them, from which they directed their attack or defence.

The *generale* was soon beaten, and the troops assembled. The news of the death of Dupuy excited in the soldiers an eager desire of vengeance. The general in chief ordered a battalion to march towards the grand mosque, where the Turks were assembled to the number of eight or ten thousand. They were summoned to sur-

render, which they absolutely refused. The citadel then fired upon the town, and chiefly upon this mosque, into which some bombs were thrown. Several battalions were dispersed through the city, and directed against the other mosques, where mobs were collected; they were attacked at the same time, and all equally repulsed. Obligated to shut themselves up in their mosques, they saw, but it was too late, their imprudence: the French forced the gates, and made a terrible carnage among them. But, though defeated, they were not beaten, the number of the dead was replaced by fresh insurgents. This day was bloody, but the following was more so. Every one found armed with a cudgel or a stake was put to death. The Turks, on their part, had already assassinated several Frenchmen who were found alone in the streets. The hopes of pillage animated them, and they proceeded to attack the houses inhabited by the French. General Cafferelli's house was entirely plundered, and his guard and agents murdered.

On the 2d of Brumaire (Oct. 23) there were still some traces of the transactions of the preceding day: but towards the evening all was calm, and tranquillity began to be restored. The loss of the insurgents is calculated at five or six thousand, and that of the French at about one hundred men killed, and several wounded, chiefly by large stones which the inhabitants threw from the tops of their houses.

In this affair the Greeks, who reside at Cairo, gave the greatest proofs of their courage and attachment to the French: one of them, named Barthelemy, particularly distinguished himself, and has received marks of favour from the general in chief. They did not confine themselves to defending our cause; but, pointed out those who had taken up arms, and escaped by flight. They made a great number of prisoners; and none who were found to be criminal escaped death.

Some groups of the insurgents fled armed from the town, hoping to escape by a speedy flight; but the Arabs of the desert, who are equally the enemies of all who are foreign to their tribe, pillaged them, and General Danourt pursued them closely with the cavalry.

There are just grounds to presume that the chiefs of the religion were in concert with the mamelucks, the instigators of this revolt: of this there are some unequivocal proofs. In consequence of the inquiries which have been made, several mamelucks have been found concealed in the houses of Turks; others were dressed as women. All who were discovered in consequence of the united vigilance of the French and Greeks have been punished, in virtue of an *arrete* of the commander in chief anterior to that time."

Here it is curious to remark, that, through the whole of the above dispatch, the name of Buonaparte is not mentioned: it is always "general in chief."

Murat Bey expresses himself nearly in the following terms with respect to the action in which he was engaged with Gen. Dessaix:

"I was entrenched near the bridge of Pharon, some leagues from Cairo, and my project was to straiten the French more and more, and to intercept their provisions. But being informed by my scouts that 12,000 infidels had embarked, and drew near with four vessels laden with arms and ammunition, I advanced to meet them with my cavalry by reascending the Nile. I fell in with the enemy and fought them during the whole day; the next day we renewed the fight, and continued it for six successive days. The infidels at length succeeded

in

in landing with their artillery, and formed three entrenched camps. Our cavalry, confiding in the assistance of the prophet, attacked them again, and one thousand of them were made to bite the dust. I proceeded afterwards to the defiles of Tajun Raft, with a view of collecting my infantry, and getting the wounded taken care of. The infidels are very much weakened and dispersed. It cannot be doubted that they must, with the protection of the Almighty, be shortly annihilated."

The advices from India by the last ships state, that Tippoo Saib was placing himself in a warlike attitude, under the expectation no doubt that Buonaparte's army would have made some farther progress than it has been able to do. There can be no question that a combination exists between the two powers; but, as no apprehensions of danger are now entertained from the army of Egypt, it is probable that Tippoo's preparations will cease, as soon as he learns the difficulties which the French have to encounter for their own preservation. The English government has, however, taken every prudent precaution to augment its military force in India; and accordingly a detachment of two thousand men from the Cape embarked in the beginning of November for the different presidencies, under convoy of the Sceptre and Raifonable men of war.

Commodore Blanket, with his Squadron, passed the Cape of Good Hope early in November, but without touching at it. His destination is to take possession of the island of Socotora, which commands the entrance of the Red Sea. When the commodore sailed, there were greater apprehensions than are now entertained respecting the success of the French expedition to Egypt.

We have now before us the second part of the valuable correspondence of the "Army of the East," intercepted, like the first, by the joint vigilance of the Turkish and English governments.

The uncontrollable dominion which we possess in the Mediterranean, and the annihilation of the French flag in that sea, have rendered what was before a matter of extreme difficulty, almost an impossibility. All the intercepted letters are full of complaints of the want of intelligence: none is received, and none is sent, unless to be taken before their eyes by our cruizers. Nay, so completely are the French in Egypt secluded from the world, that even in the last letters we find them altogether ignorant of the three events which most concern them, the hostility of the Turks, the revolt of the Maltese, and the renewal of the war in Italy!

Buonaparte himself ("the undisturbed possessor of Egypt," as he is styled) is so sensible of the innumerable obstacles which oppose his communicating with France, that he has long since ceased to attempt it in the usual way. From the period of his defeat by Ibrahim Bey, he has ceased writing altogether, and has had recourse to the press. His official papers of every kind are printed in great numbers, and trusted to itinerant Syrians, Jews, &c. who frequent the Egyptian marts, and who are paid for conveying them secretly to Scanderoon, Beirut, or St. John d'Acre, in hopes of finding some neutral vessel there that will undertake to forward them to France. Several copies of the general's last dispatches, were discovered plaited into the clothes of a Jew at Acre. Others have found their way to Constantinople, and from thence to France. Can there be a stronger proof

proof of the dreadful situation to which Buonaparte is reduced, than this expedient—favouring so strongly of despair?

We shall endeavour to give some extracts from this interesting work, as occasion may offer.

It does not appear, that, since Buonaparte assembled a divan at Cairo in the month of October last, there is any certain knowledge of the transactions of the French army. A general insurrection seems to have followed that meeting; but its immediate causes and consequences are yet to be developed. Not a single official letter has reached Europe since it took place, and the few private ones which have come to hand are more calculated to provoke than to satisfy the public curiosity. It only appears that hundreds, perhaps thousands, fell on each side; but whether the French ultimately prevailed, and have to look to a second insurrection for their final extermination, or whether they were cut off in that of which we speak, is a matter of which this part of the world remains at present in perfect ignorance. It is probable that the army of the east is by this time a shadow of a shade; and that, among the few which may yet reach France after the re-capture of Alexandria (an event that must speedily take place), not one will be found who shared in the "immortal battle of the Pyramids," or the "triumphant expedition to the confines of Syria!"

It appears that, with the exception of such packets as were on-board the *Généreux*, and which might reach Paris by the way of Ancona, the directory have not received a single original dispatch, nor the people of France a single original letter, from the army of the east, since the capture of Malta. The first dispatches of Buonaparte and Berthier were taken by the Turks, and sent to Constantinople. There the Porte permitted them to be copied by the different ambassadors; and those who are acquainted with the politics of one of the northern courts, who know that the French have an active agent in every one of its ministers, will not be long at a loss for the manner in which they reached the directory. Private letters (that is to say, copies of them) have found their way to France through the same channel; for most of the originals are in this country.

At the time of the arrival of Buonaparte in Egypt, the Paris papers were filled with accounts of the vast treasures found in that country. We had then only the general's public declarations to guide our opinion; we shall now see that his public and private professions differ very materially.

General Buonaparte to Citizen Joseph Buonaparte, Deputy to the Council of Five Hundred, at Paris, dated Cairo, (7 Thermidor,) July 28th.

You will see in the public papers the relation of the battles, and of the conquest of Egypt, which has been sufficiently disputed to add another leaf to the military glory of this army. Egypt is the richest country in the world, in wheat, rice, pulse, and cattle. Barbarism is at its height. There is no money in the country; no, not even to pay the troops. I think of being in France in two months. [It is worthy of observation, that this sentence was written the very day after Buonaparte had declared in his official letters, to all Europe, that on the bodies of the 2000 mamelucs, who fell in the "battle of the pyramids," his soldiers had found 20,000,000

livres

livres in specie. But this is not all,—it appears from the next line that Egypt was expected to furnish money for the troops. This is a curious circumstance, and affords matter for deep reflection. Buonaparte left France, perhaps, without a single day's pay for his army. The plunder of Malta, except a few ingots which were distributed amongst the merchants of Alexandria, with a view of being speedily reclaimed, was on board the *l'Orient*, and with the expected treasures of Cairo, and the grand caravan, was, undoubtedly destined to swell the private fortunes of the general and his confidants; while the troops were to be left as in Swabia, and Franconia, and Brabant, and Holland, and Italy, and Switzerland, to support themselves by wresting from the inhabitants, who are thus, in mockery, "made free, and prosperous, and happy," the miserable reliques of the rapacity of the officers, and the agents of government.]

Take your measures so that I may have a country seat at my arrival, either in the neighbourhood of Paris, or in Burgundy: I reckon on passing the winter there.

The following are some of the most interesting articles of intelligence which have been received since our last report on this subject.

CONSTANTINOPLE, *March 3.* The government received some days ago direct information from the Pacha of Acric, that General Buonaparte, in person, having passed the Isthmus of Suez, had advanced as far as Gaza, a small town situated on the sea-shore, six days march from Cairo; and had taken possession of it without any resistance. It is also said, that Sir Sydney Smith has proceeded to bombard the town of Gaza, and to support the operations of the army of Syria.—A division of the Russian and Turkish troops which had been destined against Paswan Oglou, had proceeded to join the Pacha of Acre, who assures the Porte, that Buonaparte, notwithstanding the strong fortifications which he has constructed for his defence, would shortly be in his power.

MARCH 9. On the 28th of February, 1,500 bostangis were embarked on-board of two Turkish frigates and several transports, destined to join the division of Egypt. These troops form part of a body of infantry trained to the practice of European tactics. Buonaparte, whom Ghezzar Pacha was preparing to attack with a numerous army in Egypt, has anticipated the attack by sending a part of his troops, under General Kleber, into Syria, who has taken the town of Gaza. The news has been sent to the Porte by Ghezzar himself, who was still at Acre, the seat of his government. The English began to bombard Alexandria on the 3d of February, and, though the fire was terrible, it did not succeed in making the French evacuate the place.

MARCH 18. Ghezzar Pacha, having received information of the capture of Gaza by the French, ordered his army to move in a direction by which the French have been turned, and their communication with Cairo cut off. Murad Bey is strongly intrenched in Upper Egypt, and waits the arrival of Ghezzar Pacha. Two vessels more have sailed from this port laden with military stores for the English Squadron before Alexandria, which continues to bombard that town.

APRIL 3. Two couriers dispatched by Ghezzar Pacha from Acric, have brought very disagreeable intelligence of the army destined to oppose

oppose Buonaparte. The French have not only taken Gaza, in *ci-devant* Judea, but also Giatta, formerly known by the name of Joppa, which is only nine leagues from Jerusalem, and 160 Italian miles from St. John of Acre. They are indebted for their advantages to their alliance with the natives of Mount Libanon, who have been at all times enemies of the Turks. Ghezar also states, that he is thus placed between two dangerous enemies, whom he cannot keep off, and that he even apprehends they will attack him in the seat of government. He had sent a body of 30,000 men against the French, but they were completely routed, and he has only been joined by 1000 European troops, although 10,000 were to have been sent to his assistance. He renews his demand for immediate reinforcements, as he fears his castle may be besieged. It is apprehended at Constantinople, that Jerusalem, Damas, and all Syria, have fallen into the hands of the French.

APRIL 16. We have at length received official news from Egypt, which state, that the French, under the order of Buonaparte, having gained a battle, were about to advance to Acre, in order to make themselves masters of Palestine, when Ghezar Pacha, rendered furious by the loss of the first battle, inspired his troops with such courage and confidence, as to make them renew the engagement with intrepidity. The issue of it proved unfortunate to the French, who were forced to fall back on Egypt, after leaving several thousand men on the field of battle. Ghezar Pacha estimates the total loss of the enemy at more than 6000 men, and has assured the Grand Signior that he will not sheath his sword until he shall have cut off the head of the last Frenchman in that part of the Turkish territory.

Buonaparte has also experienced another check in Egypt. After having collected seventeen vessels, and put on-board of them artillery and warlike stores, to be conveyed by one of the mouths of the Nile to the coast of Palestine, the convoy was attacked by the English, five vessels sunk, seven captured, and the others were chased to the islands of the Archipelago.

We farther learn, that Captains Smith and Trowbridge have made a descent upon the coast of Egypt with Russian and Turkish troops, and have intercepted Buonaparte's communication with Syria, Alexandria, and Cairo. It is reported that the French directory, desirous to give the command of its troops once more to Buonaparte, is trying every possible means to facilitate his return to France.

PARIS, April 7. Citizen Guery, captain of the 22d chasseurs, who was taken prisoner by the Russian squadron on his passage from Egypt, has brought the most satisfactory intelligence to government respecting our army. It has been re-inforced by 80,000 recruits, principally Greeks and Jews, and forts and entrenchments are formed in the chief points on the frontiers and coast. Citizen Guery has also communicated to us the following letter:

Lanus, General of Brigade, to Citizen Guery, Commander of the Garrison of Menouse, in Egypt, dated Mit Kamar, March 1.

We defeated the Arabs the day before yesterday, and took all their cattle and baggage. Upwards of one hundred and fifty of them were killed. I expect to be at Menouse in three or four days.

LANUS,
Buona-

Buonaparte, Member of the National Institute, and General in Chief, to the Executive Directory.

CITIZENS DIRECTORS, We have learned by the way of Suez, that six French frigates, which were cruising at the mouth of the Red Sea, had taken English prizes to the amount of more than twenty millions in value. The Ramadan, which commenced yesterday, has been celebrated upon my part with the greatest pomp. I have discharged the same functions which the pacha formerly had to perform. General Desaix is more than eighty myriameters from Cairo, and very near the Cataracts. He is searching for the ruins of Thebes. I am every moment in expectation of official details of a battle which he has had with the mamelukes, and in which Murat Bey has been killed, and five or six beys have been taken prisoners. Adjutant-general Boyer has discovered in the desert, in the vicinity of Faiûm, ruins never before seen by any European. Gen. Andreosi and Citizen Berthollet are on their return from an excursion to the Lakes of Natron and the Convents of the Copts. They have made several extremely interesting discoveries; and among others some excellent natron, (native alkali,) which the ignorance of the miners prevented them from before observing. This branch of the commerce of Egypt will thence become still more important. BUONAPARTE.

The following is a copy of Buonaparte's curious Proclamation to the Egyptians, dated Cairo, Feb. 20, 1799.—Wicked men had succeeded in leading part of you astray; and they have perished. God has directed me to be merciful to the people. I have been irritated against you on account of your insurrection; I have deprived you for two months of your divan, but I restore it to you this day: your good conduct has effaced the stains of your rebellion. Scheriffs, ulemas, preachers at the mosques, make it known to the people, that those who may declare themselves my enemies shall have no refuge either in this world or in the next! Can there exist any man so blind as not to see that destiny directs all my operations? Can any one be so incredulous as to make it a question of doubt that every thing in this vast universe is submissive to the empire of Fate?

Inform the people, that since the creation of the world it has been written, that, after having destroyed the enemies of Ishmaelism, and laid their crosses prostrate, I should come from the extremity of the west to fulfil the task which has been imposed upon me. Shew to the people's conviction, that in the holy book of the Koran, and in more than twenty passages of it, what happens has been foreseen, and what will happen has been equally unfolded. Let those, then, who are prevented only by the fear of our arms from cursing us, change their sentiments; for, in addressing prayers to Heaven against us, they solicit their own condemnation. Let the true believers pray for the success of our arms. I might demand of each of you the causes of the secret sentiments of your hearts; for I know all, even what you have not revealed to any one. But the day will come, in which all the world shall clearly see, that I am conducted by a superior order of beings, and that every human effort cannot prevail against me. Happy those who shall sincerely be the first to range themselves on my side.

BUONAPARTE.

*Letter from Admiral Nelson to the Governor of Bombay, dated Vanguard,
Mouth of the Nile, August 9, 1798.*

SIR, Although I hope the consuls who are, or ought to be, resident in Egypt, have sent you an express of the situation of affairs here, yet, as I know Mr. Baldwin has some months left Alexandria, it is possible you may not be regularly informed; I shall therefore relate to you briefly that a French army of 40,000 men in three hundred transports, with thirteen sail of the line, eleven frigates, bomb-vessels, gun-boats, &c. &c. arrived at Alexandria on the 1st of July; on the 7th they left it for Cairo, where they arrived on the 22d. During their march they had some actions with the mamelukes, which the French call great victories. As I have Buonaparte's dispatches now before me, which I took yesterday, I speak positively: he says, "I am now going to send off to take Suez and Damietta." He does not speak favourably of either country or people; but there is such bombast in his letters that it is difficult to get at the truth, but you may be sure he is only master of what his army covers. From all the enquiries which I have been able to make, I cannot learn that any French vessels are at Suez to carry any part of his army to India. Bombay (if he can get there) I know is the first object; but I trust the Almighty God in Egypt will overthrow these pests of the human race. It has been in my power to prevent 12,000 men from leaving Genoa, and also to take eleven sail of the line and two frigates; two sail of the line and two frigates have escaped me. This glorious battle was fought at the mouth of the Nile, at anchor; it began at sun-set, and was not finished at three the next morning; it has been severe, but God favoured our endeavours with a great victory. I am now at anchor between Alexandria and Rosetta to prevent their communication by water, and nothing under a regiment can pass by land. But I should have informed you, that the French have four thousand men posted at Rosetta to keep open the mouth of the Nile. Alexandria, both town and shipping, are so distressed for provisions, that they can only get them from the Nile by water; therefore I cannot guess the good which may attend my holding our present position, for Buonaparte writes his distress for stores, artillery, and things for their hospital, &c. All useful communication is at an end between Alexandria and Cairo: you may be sure I shall remain here as long as possible. Buonaparte had never yet to contend with an English officer, and I shall endeavour to make him respect us.

This is all I have to communicate; I am confident every precaution will be taken to prevent in future any vessels going to Suez which may be able to carry troops to India. If my letter is not so correct as might be expected, I trust your excuse, when I tell you my brain is so shaken with the wound in my head that I am sensible I am not always as clear as could be wished; but whilst a ray of reason remains, my heart and hand shall ever be exerted for the benefit of our king and country.

HORATIO NELSON.

Some late accounts state, that the whole continent of Africa, from Morocco to Egypt, has at length taken up arms against the French, at the instance of the Grand Signor. The states of Barbary and the Emperor of Morocco are not satisfied with sitting out corsairs, but have sent large bodies of troops to attack Buonaparte in Egypt, of whom the French papers scarcely speak. The two courts of the Porte

Porte and Russia continue their preparations of war with a bold perseverance which cannot be too much admired.

A Paris paper contains the following paragraph :—Capt. Marenjé, who brought the news to Genoa of the massacre of the French in Sicily, states; that when he left Egypt, the French army had abundance of provisions, and that Buonaparte had embarked four hundred sailors on an expedition to the Red Sea.

The last accounts were received from Commodore Troubridge, off the coast of Egypt, which state, that an epidemic distemper was raging in the French army, which carried off numbers every day.

The directory seems desirous to provide at least for the amusement of Buonaparte in Egypt, since passports to that country have been granted to the French actors and actresses who may wish to exhibit there. Would it not have been more apropos to have got their passports signed by Lord Nelson?

Among other possible consequences of Buonaparte's expedition to Egypt, and the success which has attended his arms, there is one event which suggests itself with peculiar force to the mind, when considered in reference to the Jews. This dispersed but numerous people, it is well known, have never lost sight for a moment of the predictions which announce their restoration as a civil community, their national independence, and return to the Holy Land. There can be no doubt, therefore, but the capture of Jerusalem and Palestine, in general, by Buonaparte, must lead them to look forward to that event with the most sanguine hopes. When Buonaparte left France, this was one of the professed objects of his expedition; and, as there are numbers of Jews on all the shores of the Mediterranean; we shall be surprised if he does not attempt to carry this object into effect. This is an age of wonders! The pope overthrown, Turks and Christians united in a war of religion, and the Jews restored!

Sir Joseph Banks is stated, to have received letters from Horneman, the German naturalist, who went to Grand Cairo. Buonaparte, Monge, and Berthollet, had received him very kindly. Horneman set off by the caravan of Fezzan, on the 12th of September, with camels, horses, and other merchandize. He passed for a merchant, but not one of great property, for fear of exciting the avarice of his guides. He met by accident with another German, his countryman, who had been long in Egypt; and who had changed his religion to that of Mahomet, who had been three times in a pilgrimage to Mecca, and who spoke the Turkish and Arabic languages with great fluency. This man was on the point of returning to Europe, but was prevailed on by Horneman to lay aside his intention, and to accompany him into the interior. Horneman purposes to go to Fezzan, and from thence to Cashna: he will continue as long as he is able in the interior of Africa, and will return either westward by Senegambia, or eastward by Ethiopia. He is in good health and spirits, and the country agrees well with him.

The following account of the fair sex in Egypt, is extracted from a letter written by a French philosopher, who went thither with Buonaparte.—“The women never appear in the streets without a mask. I have heard the fine ladies of Paris, who are discontented with the revolution, say, that they would rather live in Turkey than in the republic. Let them come here, and see how they would

like the change. Here woman appears to be convinced that she is of a species inferior to man; and in fact she is only his servant. The wives of the richest individuals do all the drudgery work of the kitchen. Women carry the mortar and stones to the builders, but still with masks on their faces. I never in my life saw such disgusting figures. These women, who dare not appear in the streets without their veils, remain until the age of ten entirely naked. Every day we meet girls of this age without any covering. They neither blush themselves, nor make others blush, when they are seen in this condition. What will be said of this fact by those who maintain that modesty is an innate principle? For our observation we are inclined to believe that this delicate sentiment has its sole foundation in arbitrary institutions, in simple conventions, the objects of which vary in different countries. Here it is an offence against modesty for a woman to have her countenance uncovered; it is indecent to shew her hand; but they take no care to conceal the bosom and other parts of the body."

The wives of the *mamelucks*, on whose superior charms historians have so long and universally dwelt, are female slaves, brought from Georgia, Mingrelia, &c. Their beauty is a constant topic, and universally received on the credit of fame. But an European, who has only been in Turkey, has no right to give his testimony on the subject. These women are more invisible here than in any other quarter, and to this they are probably indebted for the reputation of paramount beauty. I had an opportunity of learning some particulars concerning them from the wife of one of our merchants at Cairo, who, by dealing in the laces and stuffs of Lyons, had access to all the harems. This lady, who has more than one claim to form a correct judgment of them, assured me, that, among a thousand or twelve hundred chosen women that she had seen, she had not beheld ten real beauties! But the Turks are not difficult: provided a woman be fair, she is handsome; and if she be fat, she is enchanting: when they express their sense of superlative beauty, they exclaim—"Her haunches are like cushions, and her face resembles the full-moon!" They have a natural proverb, worthy the notice of naturalists: "Take a fair female for thine eye from the frigid north, but an Egyptian to thy arms from the more genial climate of the south!"

KOTZEBUE'S OBSERVATIONS ON SOCIETY.

WE are apt to say, that when a person has, by reputation, riches, or promotion, acquired a high station in the world, he forgets his former friends, and ceases to have any regard for them; but, in fact, his former friends much oftener cease to have any regard for him; nay, even hate him from motives of jealousy and envy. Nevertheless, they formerly, with great sincerity, wished him all the good fortune which he now possesses, and assisted him, with all their power, in obtaining it. Now, when he has obtained it, they hate him. How happens this? Vanity wore the mask of friendship; for we much oftener interest ourselves in behalf of an acquaintance through vanity, than through real regard. We wish to see him elevated to a certain height, in order that we may say, "he, who is so much exalted, is our friend:" But, as soon as his splendor begins to dazzle our eyes, we close them, and walk displeasedly away.

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"He is a good kind of a man," I have often heard people say; and, when I asked the reason, I have always found, they only called him a *good kind of a man* because he distinguished himself in no way whatever; or, in other words, because he was a cypher. The man most certain to be esteemed, is he who neither by the endowments of genius nor of fortune stands in the way of any other.

There are some people who are disliked by all; even by those whom they themselves like. Others have the happy talent of insinuating themselves into the favour of every one; even of those to whom they, on many accounts, might be obnoxious.—Others, again, are very agreeable to those whom they like, but towards those whom they dislike cannot assume a constrained civility. Perhaps I belong to the last description of men, and therefore own the justice of that gentleman's remark, who once advised a person, whom I by no means liked, not to associate with me: "For," argued he, very wisely, "if he imposes no constraint upon himself, in his conduct towards you, I am certain you cannot live with him; and, if he does impose any constraint upon himself, I am equally certain that he cannot live with you."

A person, without whom we cannot live, is very dear to us, but a person, who cannot live without us, is much dearer; for he inspires the gratitude of vanity, and that is the most sincere of all gratuities.

The art of acquiring friends is often less necessary than that of avoiding enemies. The friend assists you in rising, and the enemy may not have been able to prevent it. But now you stand above, where it is more difficult to preserve the equipoise than it was below upon safe ground, the enemy comes behind you; gives you a slight blow on the back, and down you fall.

Ten enemies are sometimes created in obtaining one friend, whose friendship is envied by those ten. They are sure to pour forth a volley of accusations, to make every weakness a crime, every fault a vice, every single transaction a daily custom, every suspicion a certainty. If I like, now and then, to look at a pretty girl, I'm a libertine; if I have the unhappy talent of sometimes being severe at a blockhead's expence, I have a bad heart; if I, by chance, among some jovial friends, drink rather too freely, I am nothing less than an habitual drunkard. A thousand times worse is it, if, in the list of enemies, there is any of the increasing sectaries, who affect a higher degree of piety than their neighbours. Their pious dispositions are not content with love and hatred; they either adore or abhor. But of all enemies in the world, the very worst is a learned woman. If, added to this, she be unmarried, and in her wane, the case is desperate indeed: for, if I were to carry her in my arms to Rome, (as I have heard people say,) and, after all my fatigues, lay her down at the gate not very softly, it would be sufficient to make her my enemy.

I have heard some people say, they can wrap themselves in the cloak of innocence, and treat detraction with contempt; but this seems to me a very difficult thing. Slander is like a heavy shower, and, though you may stand dry beneath the pentice of your conscience, the world does not see it; and, what is still worse, will not see it. Men, in this respect, differ from angels; they have more joy over one fallen sinner than over an hundred just persons.

It is remarkable what an antipathy may be created by not accepting the offer of any great man's patronage. I have experienced this in a certain learned gentleman, who offered me his assistance, and whom I can in no other way have offended, than in not having had occasion to avail myself of it.

He is wise who complains against no one, for he thereby avoids or choaks many animosities. If the enemy be not converted by patience, he is, at all events, disarmed.

"But," I hear some one say, "the man who has an unjust dislike of another, does not deserve to be spared." Right; but I am not arguing upon what *he* deserves. I am pointing out what is advantageous to *you*. You should appease his hatred for *your own* sake, not for his. And, truly, this is often easier to be done than is supposed. Be respectful towards your enemy, and he will feel flattered by that respect. Often has an inveterate slanderer been thereby converted to a warm defender.

The greater the acknowledged merits of any one, the more severe will be the sentence passed upon any of his defects, real or imaginary. In the works of a man of genius, and in the conduct of an upright man, much trouble is taken to discover blemishes. On the contrary, many allowances are made for an author of inferior abilities, and a villain, because they have already beaten a broad track, on which they are allowed to range at large. We are ready enough to find faults and blemishes in a man who has gained universal esteem, but we feel no difficulty in bringing to light the good side of a person who is universally decried. A decided fool, or a decided rascal, has at least the advantage, that he is either no longer, in the smallest respect, the subject of conversation, or that any little thing, which can be said in his favour, is loudly proclaimed—for every thing which can be said against him is already known, and consequently no longer interesting.

To people of good sense this maxim is often used :

Be not too confident.—Why is not the same said to affected fools? Have they alone the privilege of being confident?

Alas! yes. Too true it is, they have this privilege. A fool may with impunity expose his silly pride, and ridiculous vanity. He is laughed at; and the world would be angry if he improved, because it would lose an object of derision. One of the greatest advantages, therefore, which fools enjoy, is, that they need never be diffident.

Tradesmen often give credit, or they would sell but little: they have also often losses. It is exactly the same in society, when we exchange civilities and attentions. The whole speculation is sometimes lost; but such a loss makes us poor in no greater a degree than as we lose courage to make a farther venture.

As we are obliged to live among mankind as if we loved and respected them, would it not be better if we endeavoured to love and respect them in reality? Alas! I have made many endeavours, and many have been fruitless.

Envy is unfortunately one of the most natural passions which agitate the mind of man. If we do not envy another's merit, we envy, at least, his reputation, which is the consequence of that merit. We admire a reserved man of abilities, because we, at the same time, think we shall discover his hidden abilities, and because we

thereby pay a compliment to our own penetration and judgment. Where the veil of reserve is wanting, to deserve esteem is often a hindrance to the attainment of it.

It is only a heart replete with goodness and philanthropy which can pardon the superior understanding of another. He who endeavours, by his genius and understanding, to please mankind, acts as absurdly as if he were to introduce himself to a patron through the interference of that patron's deadliest foe.

Why are the men of this age more polite to each other, and less polite to the ladies, than in former times?

They are more polite to each other, because they have more sense and less courage, than they had two centuries ago. They feel that it is a folly to be engaged in eternal quarrels and combats; they therefore avoid them, by an increase of civility and respect. There are more reasons why they are less polite to the ladies. In the first place, the ladies (with all due respect be it said) are not quite so domestic, or virtuous, as their great grandmothers. Secondly, the former heroic attachment of knights, and the slavery attached thereto, are extinguished. We love in quite a different way. We have other things in our heads. We think more of money than of fame in arms. The knights of former times had nothing to do, but to wield the lance and love their mistresses; they therefore attended to these two pursuits with all their ardour.

The world will sooner pardon a vicious than a ridiculous man; and it is dreadful truth, that almost every man had rather appear vicious than ridiculous, if the choice were in his power.

To think unlike the world is courage of the mind. To avow such thoughts is courage of the heart, and—*folly*.

There are many things which the fool believes he knows perfectly, and which the wise man despairs lest he should never know.

MEMOIRS OF JOHN WOLCOTT, M. D.

THIS gentleman, better known by his poetical appellation of PETER PINDAR, is a native of that part of Devonshire which has been called the Garden of England. He was educated, we believe, at Kingsbridge, near which he was born. The school-master of that town, an exceeding good scholar, and a man of most amiable manners, was a quaker.

The uncle of our bard being a single man, and established at Fowey, in Cornwall, as an apothecary, took his nephew, when young, with a view to his succeeding him in his business. Here he acquired a tolerable share of medical knowledge; and was in great esteem with his kinsman, and the neighbourhood. At his leisure hours he cultivated his mind by the perusal of the best modern writers; and improved himself considerably in the art of drawing, to which he shewed an early propensity.

On the appointment of Sir William Trelawney to be governor of Jamaica, about the year 1769, Mr. Wolcott felt a strong inclination to accompany him, especially as that gentleman was a distant relation of his own, and a great friend to the family. He accordingly pressed his uncle, not only to give his consent to the project, but also to solicit the favour from Sir William.

The old gentleman was at first extremely concerned at this turn in
his

his nephew's mind. It was a complete overthrow of his favourite scheme respecting him, and it was moreover depriving himself of a most useful assistant. Remonstrances, however, were vain; and therefore, with the greatest good nature, he waited upon the governor, and obtained the favour that the young adventurer should make one in his suite.

In the voyage the ship touched at Madeira, where Peter, enchanted with the beauties which nature so luxuriantly exhibits in that island, wrote some exquisite sonnets. On his arrival at Jamaica, he commenced surgeon, with which he blended the practice of physic, and was actually nominated physician-general to the island. A circumstance however occurred that diverted him for some time from his medical career, and threw him into the arms of a profession, for which few men were ever less qualified.

The incumbent of the most valuable living in Jamaica happened to pay the last tribute to nature (not long after the doctor settled there. Whether his practice had not been sufficiently lucrative, or what other motive possessed him, we know not, but certain it is, he looked upon the vacant rectory with a wishful eye. As there was no clergyman at hand to supply the place of the deceased, the physician of the body commenced physician of the soul, and actually officiated for a considerable time in this capacity, reading the prayers of the church of England, and preaching occasionally. Fearing at length, that he should be superseded, by a regular minister properly instituted to the living, the doctor set out for England, carrying with him strong letters of recommendation to the Bishop of London, that he might not only be ordained, but also be appointed to the church which he had served. But, though his application was backed pretty strongly by some very considerable friends in England, the bishop refused to admit him, on the ground, we believe, of his having presumed to perform the ministerial duties without being properly licensed thereto.

In consequence of this disappointment, the doctor declined revisiting his patients and parishioners in the West Indies; but, having previously obtained the degree of M. D. from one of the Scotch universities, he went down to the place of his former residence, and, after living there some time, removed to Truro, where he practised for several years as a physician, with great credit and success. About this time his uncle died, and left him nearly two thousand pounds.

The doctor's satirical vein shewed itself on various occasions, in Cornwall; particularly in some humorous jokes, which he played off upon the late Mr. Rosewarne, of Truro, and other gentlemen of the neighbourhood. He was also engaged in some troublesome and expensive lawsuits; one of which was with the corporation of Truro, relative to their right of putting upon him a parish apprentice. In consequence of these disputes, he found that part of the world disagreeable, and therefore resolved to quit it for a sphere more congenial to his talents and disposition.

During his residence in this country, the doctor had an opportunity of bringing forward to the world an eminent natural genius, who otherwise might have been buried in total oblivion, or at the most have been a sign-painter in his native country. The person we allude to was John Opie, whose rude drawings in common chalk, especially likenesses, our doctor viewed with some curiosity and admiration

miration in his rides through the village of St. Anne, where Opie was a parish apprentice to one Wheeler, a house carpenter. These drawings were so superior to what could be expected in such a place, and from such a person, that the physician was induced to become his instructor and his patron. He accordingly furnished him with materials, and gave him lessons, by which he profited in a manner that surprised and delighted the benevolent tutor. Having made a rapid progress, Opie went to Exeter, where he acquired some knowledge of oil painting. From that city he removed to London, and under Sir Joshua Reynolds became one of the most eminent artists of the age.

Our author's first literary production was an "Epistle to the Reviewers," 4to. 1782, a truly laughable piece of satire, and certainly discharged against fair game. His next performance was "Odes to the Royal Academicians," 1785, in which is a happy mixture of wit, taste, and elegance, but at the same time it must be allowed, that a want of candour distinguishes the criticisms, and particularly with respect to the paintings of Mr. West.

In the year following, he published another set of odes to the members of the Royal Academy, bearing the same characteristics. About the same time he produced a performance of more originality and boldness. This was the *Loufiad*, a mock-heroic poem, abounding in wit, humour, and strength. The foundation on which our satirist erected this lively piece, was this:—His majesty one evening at supper observed a human hair upon his plate, among some green pease. This offensive object occasioned a decree to be issued forth, that all the cooks, scullions, &c. in the royal kitchen, should have their heads shaved. Great murmurings were excited by this mandate; but the law, like that of the Medes and Persians, was irrevocable. On this incident, Peter formed his exquisite production; only changing the hair, by virtue of the *licentia poetica*, to a living animal.

His next production was an epistle to James Boswell, Esq. the self-sufficient attendant upon Dr. Johnson to the Hebrides. This was followed by "Bozzi and Piozzi," in which the folly of tittle-tattle biographers is exposed in the happiest manner.

The greatest success attended our author's publications. Never did any satirist display such various excellence. Those who disapproved his sentiments, and were offended at his freedom and want of respect for authority, could not read his poems with unmoved muscles. To give a catalogue of his numerous writings would be needless. There can be no occasion to specify at length what is universally known, and as universally admired. Though our author has shone most conspicuously as a satirist, and here indeed his splendour has been of an extraordinary brilliancy, yet the reader of his sonnets will sometimes be disposed to regret his having devoted so much of his time and genius to temporary and personal subjects.

The doctor, we understand, lately superintended a new edition of Pilkington's Dictionary of Painters, to which he made some additions. Before we conclude, it may not be amiss to remark, that in his conversation our satirist does not exhibit either that facetiousness or acerbity which are so eminently displayed in his works.

Our poet, we believe, once more practises as a physician. Lately recovered from an asthma, he has acquired an intimate acquaintance

with the theory of that disease, and is himself a living instance, that with skilful management it is not fatal, even in its last and worst stages. He has also minutely investigated the structure of that delicate organ, the human ear. This is a species of knowledge neither to be obtained on the summit of Parnassus, nor drawn from the fountain Hippocrene; but, there is a certain universality in genius, which, indeed, constitutes one of its chief characteristics.

STATE OF FRENCH LITERATURE FOR JUNE, 1799.

FEW literary articles worth notice were produced in May. Two posthumous works are much read: the New Don Quixote, by Florian; and an Essay upon Fables and their History, by Bailly the astronomer. La Harpe's Course of Ancient and modern Literature is a work of considerable merit.

Several new pieces have been brought out at the different theatres, but with little success. A new theatre De Vaudeville, has been opened under the direction of Leger, and under the title of the Theatre des Troubadours. Tivoli, the Gardens of Idalia, and Elyseum, were opened this month, and numerous attended.

A fragment of the translation of the fourth Æneid, by Delille, has been read in a literary society, and received with distinguished applause.

The well-known musician Giroust died lately at Versailles, where for some time past he lived under the pressure of old age and poverty. While yet young, he obtained two prizes for two different compositions on one subject. He was music-master to the Innocents, and directed the Spiritual Concert at Paris. He was superintendant of the music of the king's chapel at the time of the dissolution of that establishment. Though appointed keeper of the national palace of Versailles, he still continued to compose civic songs for the decadary and national fetes. He was the composer of the music of that well-known piece—" *Nous ne reconnaissons sous l'empire des lois,*" &c. He set to music part of the Ode to Time, by Thomas, and the most striking passages of the Epistle to the People, by the same author. The minister of the interior, who was not informed until too late of the distressed state of Giroust's affairs, advanced him a gratuity of eight hundred franks in the name of the government; but he was then sinking under the long neglect which he had experienced on the part of the predecessors of the present minister. At the period of his death, he used to sell milk and honey to the inhabitants of Versailles.

The celebrated Piccini continues to employ the evening of his life to advantage, in the exercise of his talents; he has not yet allowed his lyre to repose. He publishes a journal for the voice and the piano-forte. The vocal parts and the accompaniments for the flute, violin, and bass, are by Piccini: the accompaniments for the piano-forte, are by Dessormery and Bouffet, whose knowledge of these instruments is well-known. It seems to be the intention of the editors that each number of this journal shall contain an Italian air, a French song, and a piece for the piano-forte.

French literature has experienced a considerable loss.—Pierre Augustin Carron de Beaumarchais died about a month ago of an apoplexy. He was buried in his own garden at Paris, and Collen-Harteville pronounced over him a short funeral oration, which

C. Guidin,

C. Guidin, who wrote it, could not, through grief, deliver himself. The genius of Beaumarchais was various—it adapted itself with equal facility to literature and to business, to commerce and to politics. The principles inculcated in his operas—*Tarare*, *Marriage of Figaro*, &c. are sufficiently known. It is said that some Englishmen had so high an opinion of the steady principles of Beaumarchais, and of the firmness of the character, that they called him, under the old government, The only free man in France; and letters thus directed actually reached him. The elevation of his soul kept pace with his genius. He embraced, with a most comprehensive and ever active spirit, whatever object he thought conducive to the public weal, in politics, literature, and commerce. On the breaking out of the American war, he shewed himself, as might be expected from a man of his principles, a very warm supporter of the cause of America, and sent over to that country, from France, immense supplies of arms, ammunition, and clothing, at the risk of his fortune and his liberty; he is said even to have contributed to the concluding of the treaty of alliance which the French minister formed with the congress, in spite of all the endeavours of the English minister, Lord Stormont, to prevent it. He never flattered governors nor their ministers, nor did he ever stoop to hate them. He defended with warmth both his friends and enemies from the envenomed tooth of calumny, and called himself the advocate of the absent. He demeaned himself ever with mildness and generosity towards those who, through envy and jealousy of his superior talents, made him the constant object of their detraction and revilings. His manners in private life were simple and modest, and gained him the love of all who had the happiness to be admitted to his intimacy. His relations were enriched by the fruits of his industry and his talents; his domestics grew grey in his service; and the companions of his youth were the friends of his more advanced age.

The museum of antiques at Paris is to be opened for the public inspection in September.—Rooms are building for the five statues which have been brought from Italy—the Apollo of Belvidere, the Muses, and the Laocöon, are to be placed in a large room prepared on purpose. Great pains are taking that the light shall be thrown into the room in such a manner, that the statues shall be seen to better advantage, if possible, than they were at Rome.

ON THE INVENTION OF COACHES.

IF by this name we are to understand every kind of covered carriage, in which one can with convenience travel, there is no doubt that some of them were known to the ancients. The *arcera*, of which mention is made in the twelve tables, was a covered carriage used by sick and infirm persons. It appears to have been employed earlier than the soft *clitica*, and by it to have been brought into disuse. A later invention is the *carpentum*, the form of which may be seen on antique coins, where it is represented as a two-wheeled car, with an arched covering, and which was sometimes hung with costly cloth. Still later were introduced the *carruca*, first mentioned by Pliny; but so little is known of them that antiquaries are uncertain whether they had only one wheel, like our wheel-barrows, or, as is more probable, four wheels. This much, however,

is known, that they were first-rate vehicles, ornamented with gold and precious stones, and that the Romans considered it as an honour to ride in those that were remarkably high. In the Theodosian code the use of them is not only allowed to civil and military officers of the first rank, but commanded as a mark of their dignity.

After this, covered carriages seem more and more to have become appendages of Roman pomp and magnificence; but the manner of thinking which prevailed under the feudal system banished the use of them, for some time. As it was of the greatest importance to the feudal lords that their vassals should be always able to serve them on horseback, they could not think of indulging them with elegant carriages. They foresaw, that by such luxury the nobility would give over riding on horseback, and become much more indolent, and less fit for military service. Masters and servants, husbands and wives, clergy and laity, all rode upon horses or mules, and sometimes women and monks more commodiously upon she-asses. The minister rode to court; and the horse, without any conductor, returned alone to his stable, till a servant led him back to court to fetch his master. In this manner rode the magistrates of the imperial cities to council, in the beginning of the sixteenth century; so that, in the year 1502, steps to assist in mounting were erected by the Roman gate at Franckfort. The members of the council, who, at the diet, and on other occasions, were employed as ambassadors, were, on this account, called *rittmeister*; and even at present the expression *riding servant* is preserved in some of the imperial cities. The public entry of great lords into any place, or their departure from it, was never in a carriage, but on horseback; and, in all the works which speak of the papal ceremonies, there is no mention of a state-coach, or body-coachman, but of state-horses, or state-mules. It was necessary that a horse for his holiness should be of a grey colour; not mettlesome, however, but a quiet tractable nag; that a stool with three steps should be brought to assist him to mount, and the emperor and kings, if present, were obliged to hold his stirrup, and to lead the horse, &c. Bishops made their public entrance on horses or asses richly decorated. At the coronation of the emperor, the electors and principal officers of the empire were ordered to make their entrance on horses, and to perform their service on horseback. Formerly it was necessary that those who received an investiture should make their appearance on horseback: the vassal was obliged to ride with two attendants to the lord's court, where, having dismounted from his horse, he received his fief.

Covered carriages were known in the beginning of the sixteenth century; but, they were used only by women of the first rank, for the men thought it disgraceful to ride in them. At that period, when the electors and princes did not choose to be present at the meetings of the states, they excused themselves by informing the emperor that their health would not permit them to ride on horseback; and it was considered as a point established, that it was unbecoming for them to ride like women. What, according to the then prevailing ideas, was not allowed to princes, was much less permitted to their servants. In the year 1544, when Count Wolf of Barby, was summoned by John Frederic elector of Saxony to go to Spire to attend the convention of the states assembled there, he requested leave, on account of his ill state of health, to make use of a
close

close carriage with four horses. When the counts and nobility were invited to the marriage solemnity of the elector's half-brother, Duke John Ernest, the invitation was accompanied with a memorandum, that what dresses of ceremony they might be desirous of taking with them they should transport in a small waggon. Had they been expected in coaches, such a memorandum would have been superfluous. The use of covered carriages was, for a long time, forbidden even to women. In the year 1545, the wife of a certain duke obtained from him, with great difficulty, permission to use a covered carriage in a journey to the baths, in which, however, much pomp was displayed; but with this express stipulation, that her attendants should not have the same indulgence. It is nevertheless certain, that the emperor, kings, and princes, about the end of the fifteenth century, began to employ covered carriages on journeys, and afterwards on public solemnities.

In the year 1474, the Emperor Frederic III. came to Franckfort in a close carriage: and, as he remained in it on account of the wetness of the weather, the inhabitants had no occasion to support the canopy which was held over him, but while he went to the council-house, and again returned. In the year following, the emperor visited the same city in a very magnificent covered carriage. In the description of the splendid tournament held by Joachim elector of Brandenburg, at Ruppin, in 1509, we read of a carriage all gilt over, which belonged to the electress; of twelve other coaches, ornamented with crimson, and of another of the Duchess of Mecklenburg, which was hung with red satin. At the coronation of the Emperor Maximilian, in the year 1562, the Elector of Cologne had twelve carriages. In 1594, when the margrave John Sigismund did homage at Warsaw on account of Prussia, he had in his train thirty-six coaches with six horses each. Count Kevenhiller, speaking of the marriage of the Emperor Ferdinand II. with a Princess of Bavaria, says, "The bride rode with her sisters in a splendid carriage studded with gold; her maids of honour in carriages hung with black satin, and the rest of the ladies in neat leather carriages." The same author mentions the entrance of Cardinal Dietrichstein into Vienna, in 1611, and tells us that forty carriages went to meet him: At the election of the Emperor Matthias, the ambassador of Brandenburg had three coaches. When the consort of that emperor made her public entrance, on her marriage, in 1611, she rode in a carriage covered with perfumed leather. Mary, Infanta of Spain, spouse of the succeeding emperor, Ferdinand III. rode, in Carinthia, in 1631, in a glass-carriage in which no more than two persons could sit. The wedding carriage of the first wife of the Emperor Leopold, who was also a Spanish princess, cost together with the harness 38,000 florins. The coaches used by that emperor are thus described by Kink: "In the imperial coaches no great magnificence was to be seen: they were covered over with red cloth and black nails. The harness was black, and in the whole work there was no gold. The pannels were of glass, and on this account they were called the imperial glass coaches. On festivals the harness was ornamented with red silk fringes. The imperial coaches were distinguished only by their having leather traces; but the ladies in the imperial suite were obliged to be contented with carriages the traces of which were made of ropes." At the magni-
ficent

scent court of Duke Ernest Augustus, at Hanover, there were, in the year 1681, fifty gilt coaches with six horses each; so early did Hanover begin to surpass other cities in the number of its carriages. The first time that ambassadors appeared in coaches, on a public solemnity, was at the imperial commission holden at Erfurth, in 1613, respecting the affair of Juliers.

The great lords imagined at first that they could suppress the use of coaches by prohibitions. In the Churmark archives there is still preserved an edict, in which the feudal nobility and vassals are forbid the use of coaches, under pain of incurring the punishment of felony. In the year 1588, Duke Julius of Brunswic published an order, couched in very expressive terms, by which his vassals were forbid to ride in carriages. This curious document is in substance as follows:—"As we know from ancient historians, from the annals of heroic, honourable, and glorious, achievements, and even by our own experience, that the respectable, steady, courageous, and spirited, Germans, were heretofore so much celebrated among all nations, on account of their manly virtue, sincerity, boldness, honesty, and resolution, that their assistance was courted in war, and that, in particular, the people of this land, by their discipline and intrepidity, both within and without the kingdom, acquired so much celebrity, that foreign nations readily united with them: we have, for some time past, found, with great pain and uneasiness, that their useful discipline and skill in riding, in our electorate, county, and lordship, have not only visibly declined, but have been almost lost (and, no doubt, other electors and princes have experienced the same among their nobility); and as the principal cause of this is that our vassals, servants, and kinsmen, without distinction, young and old, have dared to give themselves up to indolence and to riding in coaches, and that few of them provide themselves with well-equipped riding horses, and with skilful experienced servants, and boys acquainted with the roads: being not able to suffer, any longer, this neglect, and being desirous to revive the ancient Brunswic mode of riding, handed down and bequeathed to us by our forefathers, we hereby will and command, that all and each of our before-mentioned vassals, servants, and kinsmen, of whatever rank or condition, always keep in readiness as many riding horses as they are obliged to serve us with by their fief, or alliance; and have in their service able experienced servants, acquainted with the roads; and that they have as many horses as possible, with polished steel furniture, and with saddles proper for carrying the necessary arms and accoutrements, so that they may appear with them when necessity requires. We also will and command our before-mentioned vassals and servants to take notice, that when we order them to assemble, either all together, or in part, in times of turbulence, or to receive their fiefs, or when on other occasions they visit our court, they shall not travel or appear in coaches, but on their riding horses, &c." Philip II. duke of Pomerania-Stetten, reminded his vassals also, in 1608, that they ought not to make so much use of carriages as of horses. All these orders and admonitions, however, were of no avail, and coaches became common all over Germany.

It would be difficult to give an exact description of these carriages without a figure, and drawings or paintings of them do not seem to be common.

In the history of France we find many proofs that at Paris, in the fourteenth, fifteenth, and even sixteenth, centuries, the French monarchs rode commonly on horses, the servants of the court on mules, and the princesses, together with the principal ladies, sometimes on asses. Persons of the first rank often sat behind their equerry, and the horse was often led by servants. When Charles VI. wished to see incognito the entrance of the queen, he placed himself on horseback behind Savoisy, who was his confidant, with whom, however, he was much incommoded in the crowd. When Louis duke of Orleans, that prince's brother, was assassinated in 1407, the two *écuyers* who accompanied him rode both upon the same horse. In the year 1534, Queen Eleonora and the princesses rode on white horses during a sacred festival. That private persons also, such as physicians for example, used no carriages in the fifteenth century, is proved by the principal entrance to their public school, which was built in 1472, being so narrow that a carriage could not pass through it, though it was then one of the widest at their period. In Paris also, at all the palaces and public buildings, there were steps for mounting on horseback, such as those which the parliament caused to be erected in 1599; and Sauval says on this occasion, that, though many of these steps in latter periods had been taken away, there still remained several of them in his time at old buildings.

Carriages, however, appear to have been used very early in France. An ordinance of Philip the Fair, issued in 1294, for suppressing luxury, and in which the citizens' wives are forbid to use carriages, is still preserved. Under Francis I. or rather about 1550, somewhat later, there were at Paris, for the first time, only three coaches, one of which belonged to the queen, another to Diana de Poitiers, the mistress of two kings, Francis I. and Henry II. by the latter of whom she was created Duchess of Valentinois, and the third to René de Laval lord of Bois-dauphin. The last was a corpulent unwieldy nobleman, who was not able to ride on horseback. Others say, that the three first coaches belonged to Catherine de Medicis; Diana duchess of Angoulême, the natural daughter of Henry II. who died in 1619 in the eightieth year of her age: and Christopher de Thou, first president of the parliament. The last was excused by the gout; but the rest of the ministers of state soon followed his example. Henry IV. was assassinated in a coach; but he usually rode through the streets of Paris on horseback, and, to provide against rain, carried a large cloak behind him. For himself and his queen he had only one coach; as appears by a letter still preserved, in which he writes to a friend, "I cannot wait upon you to-day, because my wife is using my coach." We, however, find two coaches at the public solemnity on the arrival of the Spanish ambassador, Don Peter de Toledo, under Henry IV. This contradiction is a circumstance which is not worth farther research; but it shews that all writers do not speak of the same kind of carriages or coaches, and that every improvement has formed as it were an epoch in the history of them, which perhaps would be best elucidated by figures or engravings.

Roubo, in his costly treatise on joiners' work, has given three figures of such carriages as were used under Henry IV. from drawings preserved in the king's library. By these one sees that those coaches were not suspended by straps, that they had a canopy supported

ported by ornamented pillars, and that the whole body was surrounded by curtains of stuff or leather, which could be drawn up. The coach in which Louis XIV. made his public entrance, about the middle of the last century, appears, from a drawing in the king's library, to have been a suspended carriage.

The oldest carriages used by the ladies in England were known under the now-forgotten name of *whirlcotes*. When Richard II. towards the end of the fourteenth century, was obliged to fly before his rebellious subjects, he and all his followers were on horseback; his mother only, who was indisposed, rode in a carriage.— This however became afterwards somewhat unfashionable, when the monarch's queen, Anne, the daughter of the Emperor Charles IV. shewed the English ladies how gracefully and conveniently she could ride on a side-saddle. Whirlcotes were laid aside, therefore, except at coronations and other public solemnities.

Coaches were first known in England about 1580; and, as Stowe says, were introduced from Germany by Fitz-allen earl of Arundel. In the year 1598, when the English ambassador came to Scotland, he had a coach with him. Anderson places the period when coaches began to be in common use about the year 1605. The celebrated Duke of Buckingham, the unworthy favourite of two kings, was the first person who rode with a coach and six horses, in 1619: to ridicule this new pomp, the Earl of Northumberland put eight horses to his carriage.

Towards the end of the thirteenth century, when Charles of Anjou made his entrance into Naples, the queen rode in a carriage called by historians *caretta*, the outside and inside of which were covered with sky-blue velvet, interspersed with golden lilies, a magnificence never before seen by the Neapolitans. At the entrance of Frederic II. into Padua, in the year 1239, it appears there were no carriages, for the most elegantly dressed ladies that came to meet him were on palfreys ornamented with trappings. It is well known that the luxury of carriages spread from Naples all over Italy.

Coaches were seen for the first time in Spain in the year 1546; at least such is the account of Twiss, who, according to his usual custom, says so without giving his authority.

Towards the end of the sixteenth century, John of Finland, on his return from England, among other articles of luxury, carried with him to Sweden the first coach that ever had been seen there:— before that period, the greatest lords in Sweden, when they travelled by land, carried their wives with them on horseback; the princesses even travelled in that manner, and when it rained took with them a mantle of waxed cloth.

It appears that there were elegant coaches in the capital of Russia so early as the beginning of the seventeenth century.

But to what nation are we to ascribe the invention of coaches?— If under this name we comprehend covered carriages, these are so old as not to admit of any dispute respecting the question. To the following, however, one might expect an answer: Who first fell on the idea of suspending the body of the carriage on elastic springs, by which the whole machine has undoubtedly been much improved? But to this question we can find no answer, except the information before mentioned, that suspended carriages were known in the time of Louis XIV.

As the name *coach* is now adopted, with a little variation, in all the European languages, some have thought to determine the country of this invention from the etymology of the word. It is difficult, however, to determine whence it is derived, as we do not know by whom these close carriages were invented. Menage makes it Latin, and by a far-fetched derivation from *vehiculum*; Junius derives it somewhat shorter from *ὄχημα*, to carry. Wachter thinks it comes from the German word *huten*, to cover; and Lye, from the Belgic *hoetsen*, to lie along, as it properly signifies a couch or chair. But, even allowing that one could fix the origin of the word, it would by no means be ascertained what kind of a carriage we ought properly to understand by it. Mr. Cornides has lately endeavoured to prove, that the word *coach* is of Hungarian extraction, and that it had its rise from a village in the province of Wieselburg, which at present is called *Kisfee*, but was known formerly by the name of *Kosfee*, and that this travelling machine was even there first invented. However this may be, the grounds on which he supports his assertion deserve to be here quoted, as they seem at least to prove that in the sixteenth century, or even earlier, a kind of covered carriages were known under the name of Hungarian carriages. As the word *gutschi*, and not *gutsche*, was used at first in Germany, the last syllable gives us reason to conjecture, that it is rather of Hungarian than German extraction. As Hortleder tells us that Charles V. because he had the gout, laid himself to sleep in an Hungarian *gutsche*, one might almost conclude, that the peculiarity of these carriages consisted in their being so constructed as to admit people to sleep in them. This conjecture is supported by the meaning of the word *gutsche*, which formerly signified a couch or sofa. As the writers quoted by Mr. Cornides call the Hungarian coaches sometimes *leves*, light, sometimes *veloces*, swift, one ought rather to consider them as a particular kind of carriages for travelling with expedition. It is, however, still more worthy of remark, that, so early as the year 1457, the ambassador of Ladislaus V. king of Hungary and Bohemia, brought with him to the Queen of France, besides other presents, a carriage which excited great wonder at Paris, and which, as an old historian says, was *branlant et moult riche*. Does not the first word of this expression seem to indicate that the carriage was suspended?

A peculiar kind of coach has been introduced in latter times under the name of *berlin*. The name indicates the place which gave birth to the invention, as the French themselves acknowledge; though some, with very little probability, wish to derive it from the Italian. Philip de Chiese, a native of Piedmont, and descended from the Italian family of Chiesi, was a colonel and quarter-master-general in the service of Frederic William, elector of Brandenburg, by whom he was much esteemed on account of his knowledge in architecture. Being once sent to France on his master's business, he caused to be built, on purpose for this journey, a carriage capable of containing two persons; which in France, and every where else, was much approved, and called a *berline*. This Philip de Chiese died at Berlin in 1673.

Coaches have given rise to a profession which in large cities affords maintenance to a great number of people, and which is attended with much convenience; I mean that of letting out coaches for hire, known under the name of *fiacres*, hackney-coaches. This originated

in France; for about the year 1650 one Nicholas Sauvage first thought of keeping horses and carriages ready to be let out to those who might have occasion for them. The Parisians approved of and patronised this plan; and as Sauvage lived in the street St. Martin, in a house called the *hôtel S. Fiacre*, the coaches, coachmen, and proprietor, were called *fiacres*. In a little time this undertaking was improved by others, who obtained a license for their new institutions on paying a certain sum of money. Some kept coaches ready in certain places of the streets, and let them out as long as was required, to go from one part of the city to another. These alone, at length, retained the name of *fiacre*, which at first was common to every kind of hired carriage without distinction. Others kept carriages at their houses, which they let out for a half or whole day, a week, or month: these coaches were known by the name of *carrosses de remise*. Others kept carriages which at a certain stated time went from one quarter of the city to another, like a kind of stages, and took up such passengers as presented themselves; and, in the year 1662 some persons set up carriages with four horses, for the purpose of carrying people to the different palaces at which the court might be. The proprietors often quarrelled respecting the boundaries prescribed to them by their licenses; and on this account they were sometimes united into one company, and sometimes separated. The police established useful regulations, by which the safety and cleanliness of these carriages were promoted; marks were affixed to them, by which they might be known; and young persons and women of the town were forbidden to use them, &c.

A particular kind of hackney carriage, peculiar to the Parisians, in the opinion of some does no great honour to their unbanity. I mean the *brouettes*, called sometimes *roulettes*, and by way of derision *vinaigrettes*. The body of these is almost like that of our sedans, but rolls upon two low wheels, and is dragged forwards by men. An attempt was made to introduce such machines under Louis XIII. but the proprietors of the sedans prevented it, as they apprehended the ruin of their business. In the year 1669 they were however permitted, and came into common use in 1671, but were employed only by the common people. Dupin, the inventor of these *brouettes*, found means to contrive them so that they did not jolt so much as might have been expected; and he was able to conceal this art so well, that for a long time he was the only person who could make them. The number of all the coaches at Paris is by some said to be fifteen thousand; the author of *Tableau de Paris* reckons the number of the hackney coaches to amount to eighteen hundred, and asserts that more than a hundred foot passengers lose their lives by them every year.

Coaches to be let for hire were first established at London in 1625. At that time there were only twenty, which did not stand in the streets, but at the principal inns. Ten years after, however, they were become so numerous, that Charles I. found it necessary to issue an order for limiting their number. In the year 1637, there were in London and Westminster fifty hackney-coaches, for each of which no more than twelve horses were to be kept. In the year 1652, their number had increased to two hundred; in 1654, there were three hundred, for which six hundred horses were employed; in 1694, they were limited to seven hundred, and in 1715 to eight hundred.

Hackney-

Hackney-coaches were first established at Edinburgh in 1673. Their number was twenty; but, as the situation of the city was unfavourable for carriages, it fell in 1752 to fourteen, and in 1778 to nine, and the number of sedans increased.

Fiacres were introduced at Warsaw for the first time in 1778. In Copenhagen there are an hundred hackney-coaches.

In Madrid there are from four to five thousand gentlemen's carriages; in Vienna three thousand, and two hundred hackney-coaches.

At Amsterdam coaches with wheels were in the year 1663 forbidden, in order to save the expensive pavement of the streets; for coaches there, even in summer, are placed upon sledges, as those at Petersburg are in winter. The tax upon carriages in Holland has from time to time been raised, yet the number has increased; and some years ago the coach-horses in the Seven United Provinces amounted to twenty-five thousand.

When Prince Repnin made his entrance into Constantinople in 1775, he had with him eighty coaches, and two hundred livery-servants.

SPECTRE OF THE BROKEN.

THE Broken is the name of one of the Harz mountains of Hanover in Germany; and is celebrated for reflecting to the eye of a spectator a colossal figure, called the *spectre of the Broken*. The particulars of this extraordinary phenomenon, as given by J. L. Jordan, are explained in Gmelin's Journal of Nature, published at Gottingen in 1798, and are as follow:

The first time I was deceived by this atmospheric phenomenon, I had clambered up to the summit of the Broken, very early in the morning, in order to wait for the beautiful view of the sun rising in the east. The heavens were already streaked with red; the sun was just appearing above the horizon in full majesty; and the most perfect serenity prevailed, when the other Harz mountains in the south-west, towards the Worm mountains, lying under the Broken, began to be covered by thick clouds. Ascending at that moment the granite rocks called the Teufelskanzel, there appeared before me, though at a great distance, the gigantic figure of a man, as if standing on a large pedestal. But scarcely had I discovered it when it began to disappear; the clouds sunk down speedily and expanded, and I saw the phenomenon no more. The second time, however, I saw this spectre somewhat more distinctly, a little below the summit of the Broken, and near the Heinrichshöhe, as I was looking at the sun rising about four o'clock in the morning. The weather was rather tempestuous; the sky towards the level country was pretty clear, but the Harz mountains had attracted several thick clouds, which had been hovering around them, and which beginning to settle on the Broken confined the prospect. In these clouds, soon after the rising of the sun, I saw my own shadow, of a monstrous size, move itself for a couple of seconds exactly as I moved; but I was soon involved in clouds, and the phenomenon disappeared.

It is impossible to see this phenomenon, except when the sun is at such an altitude as to throw his rays upon the body in a horizontal direction; for, if he is higher, the shadow is thrown rather under the body than before it. In the month of September, 1798, as I

was making a tour through the Harz, I found an excellent account and explanation of this phenomenon, as seen by M. Haue, on the 23d of May, 1797, in his diary of an excursion to the Broken mountain. I shall therefore take the liberty of transcribing it.

"After having been here for thirtieth time, (says Mr. Haue,) and, besides other objects of my attention, having procured information respecting the above-mentioned atmospheric phenomenon, I was at length so fortunate as to have the pleasure of seeing it. The sun rose about four o'clock, and, the atmosphere being quite serene towards the east, his rays could pass without any obstruction over the Heinrichshöhe. In the south-west however, towards Achtermannshöhe, a brisk west wind carried before it thin transparent vapours, which were not yet condensed into thick heavy clouds. About a quarter past four I went toward the inn, and looked round to see whether the atmosphere would permit me to have a free prospect to the south-west; when I observed, at a very great distance towards Achtermannshöhe, a human figure of a monstrous size. A violent gust of wind having almost carried away my hat, I clapped my hand to it by moving my arm toward my head, and the colossal figure did the same. The pleasure which I felt on this discovery can hardly be described; for I had already walked many a weary step in the hopes of seeing this shadowy image, without being able to gratify my curiosity. I immediately made another movement by bending my body, and the colossal figure before me repeated it. I was desirous of doing the same thing once more: but my colossus had vanished. I remained in the same position, waiting to see whether it would return, and in a few minutes it again made its appearance on the Achtermannshöhe. I paid my respects to it a second time, and it did the same to me. I then called the landlord of the Broken; and, having both of us taken the same position which I had taken alone, we looked towards the Achtermannshöhe, but saw nothing. We had not, however, stood long, when two such colossal figures were formed over the eminence, which repeated our compliments by bending their bodies as we did; after which they vanished. We retained our position; kept our eyes fixed on the same spot, and in a little time the two figures again stood before us. Every movement that we made by bending our bodies these figures imitated; but with this difference, that the phenomenon was sometimes weak and faint, sometimes strong and well-defined. Having thus had a sufficient opportunity of examining the *spectre of the Broken*, I am enabled to give the following explanation of the curious phenomenon, which has so long been the wonder of travellers: When the rising sun, and according to analogy the case will be the same at the setting sun, throws his rays over the Broken upon the body of a man standing opposite to fine light clouds floating around or hovering past him, he needs only fix his eyes stedfastly upon them, and, in all probability, he will see the singular spectacle of his own shadow extending to the length of five or six hundred feet, at the distance of about two miles before him. This is one of the most agreeable phenomena I ever had an opportunity of remarking on the great observatory of Germany."

TRAVELS OF C. OLIVER AND C. BRUGUIERE, UNDERTAKEN BY ORDER OF THE FRENCH GOVERNMENT, THROUGH THE OTTOMAN EMPIRE, EGYPT, AND PERSIA, DURING THE YEARS 1792, 93, 94, 95, 96, and 97.

IN the year 1792 the provisional executive council, sensible of the advantages which might result to commerce, agriculture, natural history, geography, medicine, &c. by a tour through the Ottoman empire, Egypt, and Persia; persuaded that these interesting countries had never been considered under a proper point of view, or had been considered only partially, and that we had still much to learn respecting them; made choice of C. Bruguiere and myself to accomplish that object.

After some delays, we at length sailed from Marseilles, in April 1793, in a neutral vessel, and, without touching any where by the way, arrived at Constantinople, after a pleasant voyage, on the 21st of May.

It would be difficult to express the different sensations excited in the traveller by the first view of that large city and its inhabitants. The mixture of trees, houses, and minarets; the canal of the Black Sea, the hills and valleys by which it is bordered, Scutari and the numberless villages situated on its shores, the sea of Marmora with its islands, Mount Olympus covered with snow, the variegated and fertile fields of Asia and Europe, all together present so many pictures which at once delight and astonish. One cannot help admiring the natural beauty of the environs of Constantinople, and reflecting at the same time on the happy situation of that large city, which can be so speedily supplied with provisions; which is so easy to be defended, and which enjoys the advantage of a port so safe, so commodious, and of such an extent. But, if we cast our eyes a little farther, we behold the two shores of the entrance into the Black Sea, for the space of several leagues, convulsed by subterranean fires. Different strata of lava, decomposed rocks, porphyry and granites of various colours, more or less altered, attest the flow and successive action of a great volcano. If we ascend a few leagues, we discover, for a vast extent, a mine of coal, which the Turks have not yet found means to work.

We remained six weeks in this capital of the Ottoman empire, waiting till the envoy extraordinary of the republic should receive from the minister orders respecting our mission and allowance; but the attention of government was at that time engaged with objects of more importance. Our letters remained unanswered, and we should have been thrown into great embarrassment had not our pressing wants been supplied by the envoy of the republic.

After viewing this country, so interesting in every respect, and making an ample collection of plants, birds, fishes, insects, shells, and minerals; and after sending two packages of seeds at different times to the national garden of plants, we set out for the Dardanelles, by which means we had it in our power either to proceed to the Archipelago in the spring, or to return to Constantinople in order to direct our course towards the southern shores of the Black Sea; to proceed through Armenia, Georgia, Ghilan, or Chirvan, to the borders of the Caspian sea; afterwards to traverse Persia from north to south, and

and to return by the Persian Gulph, Bussora, Bagdad, Mesopotamia, and Aleppo. As we did not, however, hear from government, and could receive only part of our allowance, we confined ourselves to excursions to different places in the neighbourhood of the sea of Marmora, the channel of the Dardanelles, Troade, Tenedos, Scio, some parts of the coast of Natolia, Mycone, and Naxia, from which we proceeded to Crete.

Agreeably to our instructions, we had transmitted to Constantinople, to be reared in the garden of the ambassador's palace, plants of a kind of apple-tree with oblong fruit of an excellent flavour, proper to be cultivated in any part of France, but more particularly in the southern departments; plants of three kinds of oak not found in our forests or gardens—one kind proper for ship-building—another *à grand cupule*, known in commerce by the name of *avellonée*, which is the *quercus agrifolia*; and lastly, that which furnishes the galls of the Levant: we added also several shrubs destined to enrich the national garden of plants.

Though several well-informed Europeans have traversed this part of the Ottoman empire; though many of them have published interesting observations on the political relations of the Turks, their manners, usages, and religion; and though we have excellent works on the plants and ancient history of these countries; we, however, found that there is still an abundant harvest to be reaped, even in the best-known part of natural history, that is to say, in regard to plants. But when we reflect that the reptiles, river fish, insects, and terrestrial shells, in those districts, have not been observed by any traveller; that no one has made us acquainted with the riches which the Turks possess in mineralogy, mines of iron and copper, pozzolana, and coals at the very gates of the capital, marble of all kinds exceedingly abundant in the islands of the sea of Marmora and the Archipelago, agates, cornelians, and chalcidies in the fissures of the volcanic rocks, mines of allum and sulphur, mineral waters of every kind; in a word, if we recollect that no traveller has considered this country in regard to geology, that part of natural history so interesting, which by enabling us to observe the different strata of earth and stones, the direction and structure of mountains, and to compare the different fossils that one meets with, must necessarily conduct to a certain knowledge of the antiquity of our globe, of the laws to which it is subject, and of the different catastrophes it has experienced, and of which some faint light has been transmitted to us by the fabulous history of antiquity, will be readily persuaded that our observations, directed to these objects, cannot fail of being highly interesting.

We remained four months at Candia; and, though two years had elapsed since our departure from Paris, we had received no intelligence from government. We were, therefore, of opinion, that it would be absolutely necessary for us to renounce our first plans; but, as we were desirous of employing our time in the most useful manner possible, we resolved to proceed to Egypt, and to traverse that country so abundant in subjects of observation, and as interesting for the politician and statesman, as for the philosopher, naturalist, and antiquarian.

The situation of the French in Egypt was extremely disagreeable: their commerce had been interrupted, and they were in a state of oppression

oppression at Cairo. Some of them had been maltreated by the government, and the council of the republic enjoyed no consideration. Our first care was to study the monstrous government of the Mamelouks, their military force, and their manners; to make ourselves acquainted with the revenues of Egypt, the present state of its commerce, and that which it might be susceptible of under a just and enlightened government. We examined the ports of Alexandria, the road of Aboûkir, the Delta, the course of the Nile, its periodical inundation, the canals which the negligence of the Mamelouks has suffered to be filled up, the monuments reared to gratify the pride of kings, and those which have been constructed in consequence of religious duties. We directed our view, at the same time, to the natural productions of Egypt, and those which might be introduced into it by cultivation; the fertility of its soil, and the diseases to which the inhabitants are exposed. We enquired into the cause of the periodical winds. In the last place we examined whether the plague, that malady so sudden and so terrible in its effects, has its source in Egypt, as some travellers have asserted, or whether it be there only casual and epidemic. Our harvest, in regard to natural history, has been very abundant: we had an opportunity of transmitting to the national garden of plants a third box of seeds from the Archipelago, Candia, and Egypt.

On the 23d of March we received letters from the envoy extraordinary, by which he invited us to quit Egypt and to return to the shores of the Bosphorus; because the time was at length arrived for carrying into effect the plans we had formed. "Regions lying farther to the east," said he, "now invite you, and I wish to confer with you before you proceed thither."

Under the same cover there were two letters of C. Desforgues, minister of foreign affairs. One was a copy of that which the minister wrote to C. Descorches; in which he requested from him an estimate of the sums necessary to be expended, in order that we might properly discharge our mission. He authorised him to supply us with whatever sums might be requisite, to procure such guides and information as the nature of our mission required, and to obtain those documents which were indispensibly necessary for our researches and observations. He concluded his letter with the following words: In all cases these two observers of nature will be subordinate to your commands; they will give you an account of all their operations, and at the end of each month you will transmit to me the result of their observations on the arts, sciences, natural history, commerce, and political state of the countries through which they pass, in order that I may give a faithful representation to the executive council, of their zeal, their labours, and their discoveries." — In the other, the minister informed us, that he had requested C. Descorches to give him an account of the ordinary expences to which we should be subjected. He concluded by desiring us to transmit our submission in writing to C. Descorches, and to conform to the dispositions contained in the letter which he had addressed to him.

We embraced the earliest opportunity of complying, both with the orders of the minister, and those of the envoy. We transmitted our submission; and, having terminated our observations on Cairo and the neighbourhood, repaired, without delay, to Alexandria. We sailed from that port on the 30th of April, and arrived at Constantinople

Constantinople after a navigation of forty-eight days. We had the pleasure of touching at the isles of Rhodes and Lero, which we had not before seen. The repairing of a leak in our vessel obliged us to remain eight days at the former; and we were detained as long at the latter on account of the north winds.

During this interval C. Descorches had been succeeded by C. Verniac. We therefore delivered to the latter a sketch of our operations, from the period of our arrival in the Levant; a statement of the sums we had received; and a minute memoir on the situation of the French in Egypt, the government of the Mamelouks, the productions and revenue of the country, the cultivation of the land, on its commerce, and lastly on the improvements of which the country was susceptible. This memoir concluded with reflections excited by the order which C. Descorches had given to the consul and French at Cairo, to repair provisionally to Alexandria, and put themselves under the protection of the port captain of the Grand Signior; and to wait there until more favourable circumstances should enable the consul to resume his functions at Cairo, and the merchants their commercial operations. We forwarded to the national garden of plants a fourth box of the seeds from Egypt, Rhodes, Lero, and the shores of the channel of the Dardanelles, as well as a live ichneumon which we had reared for four or five months.

Persia, a prey to the horrors of civil war since the reigns of the latter soppis (the family of the Sephevi), gave reason to hope for a flourishing kingdom under a monarch who had triumphed over all his rivals, and had destroyed each of them in succession. The opportunity was then favourable for travelling into the interior parts of this country, so interesting in every point of view. C. Verniac allowed us the whole of our appointment, authorised us to engage a dragoman, gave us a letter to the chief minister of the king of Persia, another to the pacha of Bagdad, and, at the same time, various instructions both verbally, and in writing.

At the moment of our departure, the Porte had a design of constructing in the harbour of Constantinople a basin after the model of that of Toulon; and some Armenian merchants wished to prevail on us to communicate to them a discovery we had made of an excellent kind of pozzolana, by offering us the sum of 30,000 piastrres. As we were here under the orders of the republic, we did not think ourselves at liberty to enter into any treaty with Armenians, in regard to our discoveries, until we had apprised the envoy of the republic. C. Verniac, who intended to get this basin constructed by French engineers, desired us to reject the offers of the Armenians, promising to procure us a more ample recompense from the Porte; and he immediately sent the first dragoman of the legation to the Turkish government, to communicate our discovery, and make an offer of our services. The Porte seemed to accept this offer with gratitude; and, having requested a note on the subject, we embraced the earliest opportunity of transmitting to it a memoir, in which we said that we had discovered pozzolana of an inferior quality near the channel of the Black Sea, in Prince's islands, and various islands of the Archipelago; and some of a superior quality, or at least equal to that of Italy, in the island of Santorin. The memoir concluded with a few details respecting the method of employing both.

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The ministers of the Porte, when they received this memoir, informed the dragoman, that the Armenians had demanded for the discovery 60,000 piastres, though they had offered us only 30,000. They added, that they would never forget the service which we rendered to them, and that their gratitude would be boundless if we could effect what we promised. On this subject we had two interviews with the Chelebi-Effendi; and that minister twice gave us reason to hope that the Porte would reward, in a manner worthy of itself, the important discovery we had communicated.

In the mean time we were just on the point of proceeding on our journey to Persia. The necessary preparations were already made, and we were looking out for a caravan going to Diarbekir, when the Porte required that we should repair to the isles of Santorin, Milo, and Argentiera, and transmit to it some bags of pozzolana, in order that previous experiments might be made. For this purpose it freighted a French vessel, and sent a chiaous to accompany us and bring back the specimens. We were obliged to touch at Metelin to receive from the captain pacha, then lying at anchor before that island, the necessary firmans.

The inhabitants of Santorin, alarmed at this discovery, and fearing that the Ottoman government would cause the earth to be dug up at their expence, and of course send Turkish officers into the island, immediately assembled to execute the Grand Signior's orders, and to devise means for warding off the blow with which they were threatened. They thought they could do nothing better than to send the primates to the Latin bishop at whose house we lodged, and to offer us a present if we would inform the Porte that we had discovered none of the above substance in the island. We, however, rejected the offer of these primates, and transmitted to Constantinople several bags filled with pozzolana of an excellent quality, which was in great abundance, and exceedingly easy to be dug up. We depended on C. Verniac for the promised recompence to which we thought ourselves entitled by the importance of the discovery, by rejecting the offers of the Armenians, and the trouble, dangers, and delay, we had experienced.

The island of Metelin, almost entirely volcanic, is remarkable on account of its great fertility, its immense ports, and its warm mineral springs. Argentiera, known formerly under the name of Cimolus, is entirely volcanic. We remarked, with pleasure, that the Cimolean earth, which it furnishes in abundance, is produced by a slow and gradual decomposition of the porphyries occasioned by subterranean fires. I collected specimens of that earth in all the states through which it passes. This observation will be interesting, no doubt, to mineralogists, and make them acquainted with the origin of a substance hitherto little known. The island of Milo is altogether volcanic. It presents a vast port, on the borders of which is a spring of warm aluminous water; a very warm grotto, where feather alum is formed; a volcano still burning, and a prodigious quantity of catacombs. The island of Santorin is remarkable for the changes effected in it by a volcano, and the sinking down of a great part of the island; from which has resulted a kind of port, more than two leagues in extent, and from the bottom of which three isles have been thrown up at different known periods. The rupture occasioned by the almost circular sinking down of the island exhibits

different strata of volcanic substances, among which we observed several kinds of pozzolana. That which we sent to Constantinople, and of which I have specimens, may one day serve for such maritime constructions as the French may think proper to make in Egypt, when they are once firmly established in that country.

We touched a second time at Rhodes, proceeded thence to Baruth, and afterwards to Sayd, with a view of going to Damascus to take advantage of the departure of a caravan for Bagdad, as we had been taught to expect; but, the caravan having departed a long time before, we were obliged to return and take the route to Aleppo. We were unwilling to quit the coast of Syria without paying at Tyre a tribute of admiration to which that city was so justly entitled.

As the road from Latakia to Aleppo is never safe, we waited some days for the departure of a caravan. During that time we transmitted to the national garden of plants a fifth box of seeds, from the islands we had visited, and the coasts of Syria. On our arrival at Aleppo we employed ourselves in examining the situation of the French in that city. We collected information respecting the commerce carried on by the Europeans with the inhabitants, and sent to C. Verniac a memoir on that subject. We also made various observations in regard to natural history and geology. We procured several birds, and a few quadrupeds: after which we set out, towards the end of winter, in company with a caravan; and, passing through Orfa, Merdin, Nesbin, and Mosul, arrived at Bagdad without any accident.

This journey was extremely interesting; for, besides the great number of objects which we collected, and the observations we had occasion to make, we were surprised to see a country exceedingly fertile, yet almost a desert, and often volcanic, exhibiting, at every step, vestiges of ancient cities. We crossed the Euphrates and the Tigris on wretched wooden boats; and two rivers, which flow from the mountains of Kurdistan, on boats formed of a number of inflated skins joined together. I shall describe, with some minuteness, this simple method of crossing rivers, because it might be employed with advantage in Europe, on account of the facility and trifling expence of transporting a great number of skins; of inflating them in a moment, and uniting them firmly together by means of the branches of trees; and of conveying, in this manner, over the largest rivers, a whole army without any danger.

When we arrived at Bagdad, the pacha was so ill that two Persian physicians, who attended him, had given over all hopes of his recovery. His astrologer had read in the stars the fatal sentence; the kiaya pacha and some of the grandees were already forming intrigues to succeed him, and the janissaries were taking up arms to sell their services to the highest bidder. The Arabs of the desert, and of Mesopotamia, waited only for the moment of his death to plunder the caravans and rob travellers. This city was threatened with a general insurrection. Commerce was suspended; and it was impossible for us to continue our journey. The pacha begged us to give him our advice, until we should have an opportunity of setting out for Persia. We thought ourselves bound to comply with his request, and had the satisfaction to restore him to health in the course of a few days. From that moment order was every where re-established; and the kiaya alone paid, with his head, for the steps he had

had taken to assume the place of his benefactor. The pacha shewed us every mark of gratitude, made us a present of two fine Arabian horses, and gave us letters of recommendation to the khan of Kermancha, and the ministers of the King of Persia.

We did not delay a moment to provide ourselves with Persian dresses, and whatever else was necessary; and departed on the 16th of May 1796, with the regret of leaving behind us a box containing several very valuable jewels, destined as presents to the Persian court, which the envoy of the republic at Constantinople was to have sent after us.

The usual heat at Bagdad, during some hours of the day, is from 110° to 113° Fahr. On the day of our departure the thermometer was already at $99\frac{1}{2}^{\circ}$ Fahr. We had here an opportunity of seeing a phenomenon which explains the origin and cause of that singular and transitory wind which destroys men and animals, if proper precautions are not taken to guard against its effects.

On our arrival at Kermancha, the first city of Persia, we waited on the khan, made him acquainted with the object of our travels, and delivered to him the letter from the pacha of Bagdad. The khan asked us many questions respecting the different states of Europe, with which he seemed to be little acquainted, and respecting our manners and customs. He dwelt most on the countries of the Ottoman empire which we had traversed, and particularly Bagdad, because in that city the ashes of Ali are preserved. He gave orders to one of his officers to accompany us to court, and procured us the necessary passports. On the 1st of June we arrived at Teheran, where we learned that the king and his ministers had set out in the beginning of spring on an expedition, the object of which was supposed to be the conquest of all Chorazan.

I was highly pleased with the idea of undertaking this journey, and I considered it as a fortunate circumstance that the king was at the head of an army in one of the most interesting provinces of Persia; into which no European traveller had penetrated, and which produces the most remarkable plants, as well as the greater part of the drugs brought to us from the eastern countries; but C. Brugiere had been ill for a long time, and was threatened with a dysentery. The dragoman himself was indisposed, and reasons were not wanting to dissuade me from undertaking the journey. "It is not positively known," said some, "where the king is; and it is dangerous to approach the army in this country, because people are plundered, and even killed, before they can be known and protected. It will require more than a month to reach Chorazan, and the king must return in two." These reasons did not counterbalance the advantages which were likely to result, from this journey, to natural history and geography; but I reflected that the health of my colleague was becoming daily worse, and that he was incapable of supporting the fatigues of travelling so far, during the hottest season of the year. It would have been necessary to traverse the Mazandaran, a hot, marshy, and extremely unhealthful, district; and besides this, the dragoman refused to accompany us. We then agreed to wait for the king in the environs of Teheran, in order that we might take advantage of the season proper for researches in regard to natural history; for collecting seeds, and for enabling C. Brugiere to re-establish his health with more facility.

We were obliged to negotiate, and to make some pecuniary sacrifices, before we could obtain permission to quit the town, and reside in a village at the bottom of Mount Albours. Teheran contained hostages from all the great cities of the empire, whom Mehemet had caused to assemble there for his security; so that people might enter the city, but could not depart from it without the express leave of the governor; and the latter did not let slip so fine an opportunity of forcing us to expend a little money. As we foresaw that the presents left behind might be retarded, and not even reach us, we thought it prudent not to make any mention of them. We had it in our power, indeed, to offer the governor a watch and some arms; but we should thus have entered into an engagement to give other presents to his principal officers, and, on the king's arrival, having nothing sufficiently beautiful to offer to his ministers, and our presents being detained at Bagdad under a pretence that the roads were not safe, we should have been considered as impostors, and should have lost that confidence which our conduct ought to have inspired.

The king, after taking possession of Meshed and all Chorazan, and after having destroyed Charok-Shah the last descendant of Thamas-Kouli-Khan, and carried away his treasures, returned to Teheran. He made his entry into that new capital towards the end of September 1796; and, two days after, we had an audience of the prime minister, with whom we had reason to be satisfied. We endeavoured to secure the friendship of the chief secretary, an active, judicious, enterprising man, and as well-informed as could be expected in Persia. We spoke to him of the new government established in France; and, at the same time, made him acquainted with its resources, population, triumphs, and power. We received from him some interesting details respecting the manners, religion, and government, of the Persians, as well as a circumstantial history of the troubles which had desolated that unhappy country since the dethronement of Shah Hussein, and particularly since the death of Nadir Shah. On the 4th of October we obtained from the minister an audience to take leave; and, some days after, his principal secretary gave us a letter addressed to the French republic, a copy of which I immediately dispatched, reserving the original, which I have since presented to the directory.

We now made haste to complete our observations and to return to Bagdad, as we already foresaw the storm which still involves that country in all the horrors of a civil war. We quitted Teheran on the 15th of October, and pursued the road to Ispahan. We had made an ample collection of objects of natural history, and of medals. We had acquired also very correct information respecting the population, revenues, and forces, of Persia; the late revolution, and the state of its commerce. Our travels, however, would have been incomplete, had we not seen the ancient capital of the empire, and the seat of the sophis. We remained a month at Ispahan, and on the 21st of December arrived at Bagdad.

Some European travellers have traversed Persia, and have given us accounts more or less correct of that empire. They have made us acquainted with the industry and commerce of the Persians; given us long details respecting the religion and followers of Mahomet; and have described the palace and gardens of Shah Abbas and his successors, as well as the public edifices of Ispahan. But the history
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of the troubles of Persia since the death of Nadir Shah; the changes in manners, agriculture, and industry, which must have been effected there by intestine wars, that continued for more than sixty years; the formation of a new empire, more powerful than Persia itself, which extends from Candahar to Cashmire, from Caboul to the country of the Moguls, comprehending the fertile banks of the Indus, cannot fail of giving new interest to a new narration. In regard to natural productions, it will be seen, by an account of the different objects which I shall not fail soon to publish, how little they are known, and how curious and important the greater part of them are.

Persia is an elevated country, covered with snow in winter from the Caspian sea to Ispahan; and, in summer, dry and exceedingly warm. It consists of mountains remarkably high, and of immense plains, for the most part uncultivated. What must astonish every traveller is, that throughout the whole empire no production can be obtained without watering: neither corn nor vines grow there but by means of water. No trees or shrubs are ever seen, but such as have been planted, reared, and watered, by the hand of man. Water is every where necessary; and yet in this country it is naturally wanting. It was requisite, therefore, that the industry of the inhabitants should supply this deficiency by subterranean channels, which convey water from all quarters, and end at a common reservoir. By taking advantage of the declivity of the ground, they then draw off different streams, near which they form habitations more or less considerable, according as the water, more or less abundant, admits of a greater or less degree of cultivation.

Though wounded, at the distance of six days journey from Bagdad, by a band of Curdes, while assisting my colleague when about to fall into their hands, I was, however, soon able to continue our journey; but C. Bruguiere, whose life was almost daily threatened in Persia, and whose health was still uncertain, could not for a long time be prevailed on to proceed. Nearly six months elapsed before I was able to persuade him to set out in order to return home. Several times, on the approach of the fine season, did I threaten to leave him; but I could never resolve to do so, as my conscience would not have ceased to reproach me, had my companion, after my departure, terminated his career at a distance from his friend and fellow-traveller.

During the time I resided at Bagdad waiting for the perfect re-establishment of C. Bruguiere's health, I employed myself in collecting different materials for a history of our travels. I have seen the ruins of Seleucia, Ctesiphon, the site formerly occupied by the celebrated Babylon; the towers called those of Nimrod, which neither time nor the hand of man has been able entirely to destroy, and which still excite the admiration of travellers.

I had in Egypt and Syria observed the Arabs, that nation so singular, and respecting whom travellers have spoken so differently. I had studied their manners, their customs, and the form of their government. It still remained for me to live among them, to travel with them, to frequent their tents, and to receive from their hands simple, frugal, and wholesome, food.

As particular circumstances obliged me at Bagdad to exercise the functions of a physician, I readily embraced that opportunity of seeing the interior part of the Mahometan habitations, and of be-

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coning acquainted with the state of their harems, and the women shut up in them. No traveller, perhaps, had been able to collect, in this respect, so many singular anecdotes.

We departed from Bagdad on the 1st of May 1797, in company with a caravan destined for Aleppo. We remained sixty-five days on the banks of the Euphrates, and in the desert employed our time in preparing plants, collecting insects, skinning birds and quadrupeds, and in making observations on the Arabs; the climate, soil, and productions, of these countries. We made only a short stay at Aleppo, where we found a letter from C. Aubert Dubayet, in which, after some compliments on account of our conduct, he requested we would return by the shortest route to France.

This invitation was perfectly agreeable to our wishes; but it was indispensably necessary that we should pass through Constantinople. Could we leave behind us a scattered collection, the fruit of five years labour and observations, exposed to the dangers of the sea and of dilapidation? Is it not certain that objects of natural history, almost all of a perishable nature, must be taken care of during quarantines by hands accustomed to manage them? How easily might manuscripts have been carried away? We had left some boxes under the care of a merchant at Constantinople, and others in an apartment of the ambassador's palace. There was a great number at Scio, and some at Latakia. We considered it as our duty to unite the whole, and to convey them all to Paris ourselves, in order that it might be seen, on our arrival, whether we had accomplished the views of government, and whether we had not deceived the expectations of the learned.

We wrote to the ambassador to make him acquainted with the motives which induced us to take the way of Constantinople. We wrote, at the same time, to the consuls of Tripoli and Cyprus, begging them to inform us when the first ship sailed for the Archipelago; after which we repaired to Latakia, where we found only a wretched Venetian ship, in which the consul advised us not to embark, as the Algerines, for some time past, had insulted the flag of that expiring republic. We then resolved to proceed to Cyprus, and to traverse that island, though in the most dangerous season; to repair afterwards to the coast of Caramania, and to proceed thence to Constantinople by crossing Asia Minor. This journey was one of the most interesting we undertook, both in regard to natural history and the information we collected respecting the manners of the Turks, in a country little known, little frequented, and yet so worthy of attention.

We arrived at Constantinople in the end of October, and should have departed thence in the *Serieuse*, some time after had we received our boxes from Scio, and those we left at Cyprus. The ambassador was employed in procuring us a passage in the *Brune* to Athens and Corfu, just at the time of his death. After that event, all our efforts to procure a safe and direct passage to France being useless, we thought we should be sheltered from all danger, and free from all reproach, if we proceeded to our isles in the Levant, by crossing the isthmus of Corinth. It was certainly of much importance for us not to fall into the hands of the English, whose ships covered the Mediterranean. It would have given us great pain to see our enemies profit by our labours, and reap the fruit of all our dangers and fatigues. We

We wrote to C. Carra Saint Cyr, *chargé d'affaires* of the republic at the Ottoman Porte, to inform him of our plan, and obtain his approbation; and at the same time to ask some pecuniary assistance, and make him adjust the statement of the sums advanced to us since our arrival in the Levant. We received a favourable answer, and such as was suited to our circumstances.

It may not be superfluous here to observe, that we had for a long time reminded the Porte of the services we had rendered to it in regard to the pozzolana; a service it perhaps thought it had sufficiently rewarded by the flattering letter which the Reis Effendi charged us to deliver to the minister of foreign affairs, accompanied with a present of 2000 piastres. We should certainly have refused, from any other government, a sum so small and so ill proportioned to our labour, expences, and the importance of the discovery, and, in particular, so far below the promises made to us; but a government so little susceptible of honest and generous conduct, would not have been sensible of the motive of our refusal.

We left Constantinople with a favourable wind on the 30th of April, in a Turkish boat we had hired; touched at one of the castles of the Dardanelles, and different points of the Troade, and, for the second time, traversed that fertile country. We paid a visit to the ancient site of Troy; saw the sources of the Scamander; went along the shores of the Simois, and thence proceeded to examine the ruins of the Troy of Alexander. We stopped half a day at Ipsera; went on-shore at Cape Sunium to see the remains of the temple of Minerva, and arrived at Athens on the 6th of May. We did not remain above twenty days in that city, which exhibits so many beautiful monuments, and calls to remembrance such great events. I have brought with me a plan of the ancient and modern city, by Fauval; and one of Marathon, which I traced out on the spot. I collected information respecting the present state of Athens and the neighbouring country, to compare it with what it was formerly. I have seen Mount Hymettus, the marble quarries of Pentelica, the cities of Eleusis and Megara. We passed through the Straits of Salamis, where the Persian fleets were destroyed; and traversed the Isthmus to embark again on the Gulph of Lepanto, from which we repaired to Patras.

It was time to terminate our observations on the Ottoman empire, and to quit these countries, now barbarous, though formerly the seat of the arts, sciences, and philosophy. It was time to place ourselves under the ægis of the republic. We arrived at Corfu on the 14th of July, after having touched at Cephalonia, Ithaca, and Parga. We performed quarantine for twenty-one days. It was not yet finished, and we began to think of continuing our journey through Italy, though embarrassed with a considerable collection, when C. Comeyras, commissary-general of the directory, arrived. We immediately applied to him in order to procure a passage to Ancona. He gave us reason to hope that he would soon assign to us for that purpose a small vessel belonging to the republic; and, in the mean time, I traversed the island and environs, sometimes alone and sometimes with my colleague, to procure information respecting the natural productions of the country; the state of agriculture, and the improvements that might be made in it; its ports and harbours; the timber of Epirus fit for ship-building; the commerce of these districts, and the manners and opinions of our new French subjects.

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On the 23d of August, and 6th of September, I delivered to C. Comeyras two memoirs, the one being a continuation of the other, in order that he might transmit them to government.

On the 9th of September we sailed in the Brune frigate for Buzent, where we spent the day, and arrived at Ancona in the course of a few days. My colleague, who had been almost always indisposed and in a state of suffering since our tour through Persia, here terminated his career, on the 3d of October 1798, in consequence of a malignant fever brought on by fatigue. He has left a family in want, whom I doubtless have no need of recommending to the benevolence and justice of the government.

I have brought with me, from the countries I have travelled through, a pretty large collection of plants, seeds, quadrupeds, birds, reptiles, river-fish, insects, shells, and minerals, as well as of medals, engraved stones, and other objects of antiquity. I have Egyptian idols and mummies; a selection of drugs, most of them unknown in Europe; a series of the medicines employed in Persia; and, in the last place, some rare and valuable manuscripts. I have just sent to the national garden of plants, seeds from Persia, Mesopotamia, the desert of Arabia, Syria, Cyprus, Asia Minor, and Greece, in order to be there sown and cultivated. A great number of those which we sent home before, have been already reared, and are in a thriving condition.

COW-KEEPING IN SWITZERLAND.

PASTURAGE being the principal employment in the interior part of the Canton of Appenzell, in Switzerland, whatever respects the breeding of the cattle, the management of dairies, and the making of cheese, is carried to a high degree of perfection among these mountaineers, who present us with the portrait of a truly pastoral nation. Here both the rich and poor are cow-keepers; though many of the latter do not grow so much hay themselves as they require for their cattle during the winter season, or have no grass lands at all. To supply this deficiency, they employ agents throughout the canton, who are to inform them where good hay may be obtained, which farmers made it in favourable weather, and then the Senn, or the great cow-keeper, who is in want of fodder, makes his agreements for the winter with wealthier farmers, to whom he successively drives his cattle as soon as they return from grass. Thus the itinerant Senn, with his cows, often visits five different places during the winter season. He who sells the hay, furnishes the Senn not only with stabling for his beasts, but boards and lodges him as well as his whole family. In return, the Senn, besides paying the stipulated price for the hay, allows to his host as much milk, whey, and zieger (a kind of lean cheese), as may be used in the house, and leaves him also the manure of his cows. In the middle of April, when nature revives, the Senn again issues forth with his herd to the meadows and fertile Alps, which he rents for the summer. Thus the life of these men is a constant migration, affording them the most pleasing variety, and blessing them with health, content, and cheerfulness.

The mountaineer lives with his cow in a constant exchange of reciprocal acts of gratitude; the latter affording him almost whatever

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he wants; and the Senn, in return, providing for and cherishing them sometimes more than his own children. He never ill-treats his cattle, nor makes use of a stick or whip: a perfect cordiality seems to prevail between both; and the voice of the keeper is sufficient to guide and govern the whole herd. The cow, in the Canton of Appenzell, enjoys more of that regard which is due to every useful creature, and is altogether more comfortable, than millions of human beings in Europe, who, placed under the influence of the cudgel and the knout, have too much reason to curse their existence.

Fine cattle are the pride of the cow-keeper who inhabits the Alps; but, not satisfied with their natural beauty, he will likewise please his vanity. He adorns his best cows with large bells, suspended from broad thongs; and the expence in such bells is carried even to a luxurious excess. Every Senn has an harmonious set of at least two or three bells, chiming in with the famous *ranx des vaches*. The inhabitants of the Tyrol bring a number of such bells, of all sizes, to every fair kept in the Canton of Appenzell. They are fixed to a broad strap, neatly pinked, cut out, and embroidered; which is fastened round the cow's neck by means of a large buckle. A bell of the largest size measures upwards of a foot diameter, is of an uniform width at top, swells out in the middle, and tapers towards the end. It costs from forty to fifty guilders, while the whole apparel of the Senn himself, when best attired, does not amount to the price of twenty guilders. The finest black cow is adorned with the largest bell, and those next in appearance have two smaller.

These ornaments, however, are not worn every day, but only on solemn occasions, viz. when, in the spring, they are driven up the Alps, or removed from one pasture to another; or when they descend in the autumn, or travel in the winter to the different farms, where their owner has contracted for hay. On such days the Senn, even in the depth of winter, appears dressed in a fine white shirt, of which the sleeves are rolled up above the elbow; neatly embroidered red braces keep up his yellow linen trowsers, which reach down to his shoes; a small leather cap or hat covers his head; and a new milk-bowl of wood, skilfully carved, hangs across his shoulder. Thus arrayed, the Senn precedes, singing the *ranx des vaches*, and followed by three or four fine goats; next comes the handsomest cow with the great bell; then the two other cows with smaller bells, and these are succeeded by the rest of the cattle, walking one after another, and having in their rear the bull, with a one-legged stool hanging on his horns; the procession is closed by a *traineau*, or sledge, on which are placed the implements for the dairy. It is surprising to see how proud and pleased the cows stalk forth when ornamented with their bells. Who would imagine, that even these animals are sensible of their rank, nay touched with vanity and jealousy! If the leading cow, who hitherto bore the largest bell, be deprived of her honours, she plainly manifests her grief at the disgrace by lowing incessantly, abstaining from food, and growing lean. The happy rival, on whom the distinguished badge of superiority has devolved, experiences her marked vengeance, and is butted, wounded, and persecuted, by her, in the most furious manner; until the former either recovers her bell, or is entirely removed from the herd. However singular this phenomenon may appear, it is placed beyond all doubt by the concurring testimony of centuries.

The cows, when dispersed on the Alps, are brought together by the voice of the Senn, who is then said to *allure* them (*lecken*). How well the cattle distinguish the note of their keeper, appears from the circumstance of their hastening to him, though at a great distance, whenever he begins to hum the *ranz des vaches*. He furnishes that cow, which is wont to stray farthest, with a small bell, and knows by her arrival that the rest are assembled.

SCIENCE AND LITERATURE, FOR JULY 1799.

THE following letter relative to the late passage of Mercury over the Sun, has been addressed by Lalande, the astronomer, to the editor of one of the Paris journals:—"I waited impatiently to mark the passage of Mercury over the Sun, in his descending node; he had never been observed completely in that position, and it will be thirty-three years from hence ere it can be done again. I had the pleasure to see Mercury enter on the Sun like a small, black, round, spot, on the 18th of Floreal in the morning, at the very minute indicated in the new tables, the ground-work of which I gave in the first memoir, read at the first assembly of the first class of the institute, on the very day of its establishment. This is so much the more satisfactory, as for the passage of the 4th of May, 1786, there was 40 minutes of error in the best tables of Mercury."

Mich. Szekely de Biborcyfalva, inspector of the mines to Count Schœnborn, at St. Niklas, near Minkath, in Hungary, has fabricated of the *Asclepias Vincetoxicum* a sort of cloth mixed with silk. He has presented a pattern of six ells and three quarters in length to the government established at Buda. This cloth, the first fabrication of which cost nine francs, but which, according to the calculations of the inventor, will not amount in the sequel to above four francs, is two ells in width and pretty fine. It appears, however, that this is not the first essay that has been made to convert the down of the *asclepias* to economical purposes; but hitherto the experiments have been only of simple curiosity, and not practised on a large scale.

Citizen C. P. Laffettrie, member of the Philomathic Society, and of that of Agriculture, at Paris, in a Treatise on Spanish Sheep, &c. lately published, has proved by a number of incontestible facts, that the fine wool with which Spain alone has so long furnished the rest of Europe, is not owing to the physical situation of that country, but to the apathy of other nations, and to certain prejudices which originate only in ignorance. He has satisfactorily demonstrated the possibility of obtaining, not only in France, but in the other countries of Europe, wool as fine as that in Spain itself; and for this purpose endeavours to impress upon agricultors, the necessity of changing the vicious regimen to which sheep are at present subjected, and to inspire them with an emulation to ameliorate their flocks, &c. It is certain that Spain has not been always renowned for its wool, and that its present most excellent breed of sheep has been introduced there from foreign countries.

A work has been lately published at Paris, entitled "The Correspondence of Voltaire, and of Cardinal de Bernis, from 1761 to 1777, as copied from the original letters, with notes, &c."—The editor is Citizen Borgoing, *ci-devant* minister of the republic at Madrid, and now associate member of the national institute. The authenticity of the

the letters cannot be contested, as the manuscripts are in possession of the Chevalier Azara, ambassador of Spain to the French republic, who, it appears, was the friend and testamentary executor of the cardinal. In fact, the reader will easily discern in them the impress of the well-known character of Bernis, as well as Voltaire's turn of wit, in the epistolary kind. Of ninety letters in this collection, two only have been printed before, in the *Correspondance generale de Voltaire*, and these are now printed again to preserve the correspondence of these two celebrated men entire. The Cardinal de Bernis was a brilliant poet, and possessed (as these letters shew) wit, talents, a critical judgment, a fine taste, and a high degree of sound classical literature: in fine, he was a man of letters worthy of a better age. The cardinal died at Rome in 1794, that is to say, about 16 years after Voltaire. He had resided in that city since 1769, under the character of minister to the king at the court of Rome, and protector of the churches of France. Previous to this, he had been ambassador at Venice, minister of foreign affairs, disgraced according to custom, then exiled, afterwards recalled, and made archbishop of Albano. By the French revolution he was deprived of all his ecclesiastical revenues in France, and reduced to his archbishopric of Albano in Italy, the income of which was so moderate, that he accepted a pension from the court of Spain, granted at the request of the Chevalier Azara.

Professor Fusch lately read to the academy of useful sciences, of Erfurt, a treatise on the composition of a varnish for pottery ware, in which no lead enters. The discovery of this varnish, which combines all the requisite qualities, is the fruit of a long series of experiments. It is thus prepared: Let there be melted, and kept in fusion for a quarter of an hour, a mixture of an ounce of fire-stone, an ounce of pounded glass, two drachms of salt, half an ounce of tobacco-pipe earth, and an ounce and a half of borax. Let the pots be plastered over with this matter, after they have been already in the fire, and put them again in it for about seventeen or eighteen hours.

It appears from the Paris journals, that the skeleton of the famous cetaceous animal which was driven on-shore alive last year, on the coast of the isles Marguerite (department of Var), is now exhibited in the *Cour des Fontaines* at Paris. A detailed description has not hitherto been given of it by naturalists. It appears, however, that this animal belongs to a species of whale very rare, and unknown to such of the Greenland and Norway fishers, as have seen it at Paris. When alive, its body was twenty-two metres long, by more than fifteen diameter. It had no teeth; but on each side of the palate it had a very thin lamina of horn, disposed one beside another in a parallel situation. The eyes were about twice as big as those of the ox, covered with hair and lids. On the summit of his head were two vent-holes formed as nostrils, separated from each other by a cartilaginous partition, and by means of which it threw up water at a prodigious height, with a hissing sound like that of a cannon ball—nothing remarkable appeared in its voluminous stomach; it could not be dissected accurately, as there was an immediate necessity to cut away and enter the fleshy parts; the large mass of flesh exhaling an odour which might have become infectious to the whole country.

That able and skilful naturalist, Frederick Humboldt, had lately quitted Paris, to pass over to Algiers, in order to commence his

scientific travels in Africa. The object of the great journey which he had proposed to make, was to pass to Algiers, in the Swedish frigate the *Jaramas*, to study Mount Atlas and the desert called Saarah, to pass over the desert with the caravan which goes from Tripoli to Mecca, and at last to join the French naturalists in Egypt. Circumstances, however, have prevented this design; the frigate suffered shipwreck in a port of Norway, and the Dey of Tripoli has prohibited the caravan from setting out. M. Humboldt; however, has not been deterred by these discouragements from his project of quitting Europe, and transporting himself, with all his instruments, into the Torrid Zone. He has repaired, therefore, to Spain, from whence he will pass to Mexico, to Peru, to Chili, and to the Philippines. He is on the eve of setting out for the Havannah, from whence he will repair to Vera Cruz. The King of Spain wished to have some discourse with him, and has given all possible facilities for his voyage, which promises useful and important discoveries for the sciences.

M. Danzel, a respectable mechanician, &c. of Hamburgh, has circulated in the German gazettes proposals for making public, under certain conditions, a certain method of moving a vessel forward, and making it obey the helm, in a time of calm, by a mechanical process. This machine, which is simple in its composition and management, and of small expence, it is said, he has tried with success, on-board the *Alster*, even against an adverse wind, and pretty fresh, at north-east. It requires no other fluid to set it in motion than the water, which it does not quit, so long as it is at work; and it may be brought on shore without much trouble. It is moved by men who remain for that purpose in the vessel. It is, in fact, an entirely new manner of hauling or towing a ship. This mechanism possesses divers other properties, not limited to a calm, nor to the water. He proposes to the connoisseurs, to the admiralties, and to the commercial world at large, that expert persons may be nominated, to judge by experiments of the utility of this invention; engaging to disclose his process at an equitable price, as a compensation for the much trouble and long labours he has undergone to bring it to perfection.

It appears from the French journals, that the rare and precious plants, cultivated in the enclosures of the museum of natural history, have suffered nothing from the rigour of the last winter.—They are all in perfect vegetation, and many of them now in flower for the first time. Among these last is a plant from Botany Bay, the seeds of which were a present from Sir Joseph Banks. It is leguminous, and appears to belong to the genus of *glycina*. It is remarkable for its configuration, which is different from that of all the plants of its family. Its flowers are of an amethyst colour. The fruit is yet expected, which will enable the naturalists to determine the nature of the plant with more precision.

There is now exhibiting, at Berlin, a female dwarf, of a more diminutive and well-proportioned stature than any *Jeu de Nature* hitherto seen. Her name is Nannette Stockerin: she is now 17 years of age, and of the ordinary size and growth of a child of 7 years old, exceedingly well proportioned, full of vivacity, and quick of apprehension. What is more remarkable, is the uncommon size and dimensions of this child at her birth, and for the two following years, in

in which she grew with so much rapidity as to attract the same notice from her unwieldiness as she now does from her diminutive proportion. Her parents were peasants in Saxony, and both of them about the middle stature. This little personage received great attention from the imperial family, at Vienna, during her stay in that city, and is particularly admired in her present residence, at Berlin, by people of every rank.

EXTRACTS FROM THE JOURNALS OF MISSIONARIES IN OTAHEITE.

EARLY this morning, April 6, 1797, Otoo sent ten men to prepare wood for erecting the blacksmith's shop. Our brethren from Eimeo returned, and made us the pleasing report, that they had been very kindly received by the natives, who never attempted to steal any of our tools, and were ready to give us every assistance. Brother J. Puckey, on the Lord's day, had addressed them by Andrew; they heard attentively, and said it was very good; but, it could be of no use to them to change their religion, as the brethren would soon leave them and carry away the book. We assured them we would return and teach them again very soon. The natives replied, if any of the chiefs embraced our religion, they should follow.

APRIL 15. Wanted plank for the blacksmith's shop; told the king—He said, "Harry-mie, come along." I thought he had some ready: I went with him and six men; he carried me up the valley, and, searching every house, took what he liked; many of the people stoutly resisted, but his men would not leave a plank. I told the king, with whom we exercised the most entire familiarity, that he was thief. "No," says he, "it is the custom of Otaheite."

The king was carried on men's shoulders, and through such dangerous places that he ran the greatest risk of breaking his bones; but he must not alight, as every place his foot touches becomes sacred, and his own ground. At last we arrived at a territory of his own: when alighting, he took a majestic stride, and stalking on—"Puckey," said he, "is this as King George walks?" I told him, yes. Having gone about three miles, I desired to return, though the king would have gone farther, notwithstanding the rain. He then gave me a hog, and made the people from whom he had taken the plank carry it down to our house."

MAY 28. This evening, after divine service, I walked, says W. Puckey, with a native who had been some time with us; and from the beautiful scene of creation around us, I took occasion to discourse of him who had made all these things. He said the God of Pretane made all things there, but not at Otaheite; that one of their gods reached up and stuck the stars in the sky; and that Mawwa, being of enormous strength, holds the sun with ropes, so that he may go no faster than he pleases. I endeavoured to undeceive him respecting these tales of their priests; and, pointing to the house at Oparre, told him they were no gods who were placed there, but the work of men's hands; for there the three great gods, Ooroo, Tane, and Taroa, are, to whom they only sacrifice in great extremities, when the priests say they are angry. I asked the young man how this was done? he, laughing, said, on these occasions a priest wrapped himself in a bundle of cloth, rolled up like a ball, and spoke

in a sharp, shrill, squeaking, voice, I am angry; fetch me hogs, kill a man, and my anger will be appeased. I endeavoured to shew him the folly and knavishness of the imposture, and regretted my want of words and language to make myself better understood. May the Lord hasten the happy time, when the power of the gospel shall take root in the hearts of these benighted people.

JUNE 11. A fact was reported to us this day, which, if true, was shocking. In one of Capt. Cook's visits he left a great monkey, who was made a chief at Attahooroo: he had a wife and thirty servants, and abundance of every thing; they called him Taata ooree harrai, the great man-dog. One day the woman seeing him catch the flies and eat them, which they abominate, she ran away into the mountains; the monkey and his toutous pursued, but being met by Temarre, who was jealous of his authority, he knocked him down with a club and killed him.

OF LIVING ANIMALS FOUND ENCLOSED IN STONES AND
OTHER SOLID SUBSTANCES.—By F. W. A. MURHARD.

OF living animals being found enclosed in solid masses, I have met with no mention in the works of the ancients. Martial, indeed, in one of his Epigrams, speaks of insects enclosed in amber; but these animals were dead, and therefore do not belong to this subject. As far as I know, Fulgos is the first author who makes mention of a living toad being found enclosed in a stone. He wrote about the beginning of the 16th century; and, the circumstance took place in the village of Meudon in Italy, in the time of Pope Martin V. He was informed by a stone-cutter, that there was nothing surprising in it, as such phenomenon had often occurred to himself. Agricola, who lived afterwards, speaks of poisonous frogs being found in stones, but which soon died when exposed for a short while to the air. Aldrovandus also speaks of marble in which these animals were found alive. Ray at first doubted the truth of these relations; but his doubts were soon removed by the undoubted testimony of eye-witnesses. Accounts of a similar kind may be found in Francis's Theatre of Various Curiosities, printed at Nuremberg in 1671. The author there speaks of toads, crabs, serpents, and shell-fish, found in stones; but it is very evident that he confounds these with petrifications.

Lloyd, in his third letter at the end of his *Lithophylacii Britannici Ichnographia*, says he was informed by Dr. Richardson, that he had found a living toad enclosed in a solid rock. Dr. Bradley mentions a fact of the like kind, having been witness to a toad found in the trunk of a large oak. We are told in the History of the Academy of Sciences at Paris for the year 1719, that a toad was found enclosed in an elm as thick as a man's body. As soon as the trunk was cleft the animal dropped out, and no opening could be discovered through which it had got into the heart of the wood. A similar circumstance is mentioned in the same work for 1731, viz. of a toad being found in an oak at least eighty or an hundred years old.

Labat, in his Travels through Spain and Italy, gives a very minute description of a kind of shell-fish found in stones fished up from the sea in the territories of Civita Vecchia, and which were eaten by the inhabitants. "While walking," says he, "on the coast of

Bichiere, I had the pleasure of seeing fished up several sea dates (*dattoli di mare*) which are produced and grow in certain stones of a somewhat spongy nature, found in great abundance in the Adriatic sea, and of which there are some also in the port of Civita Vecchia. These sea dates, which are a kind of muscles, are almost round, pointed at both ends, and consist of two shells, which open on one side, and are from one or two to nearly four inches in length.—The shell is of the same quality as that of the common muscle, but it is a little browner and less smooth on the outside. The inside has a somewhat silvery appearance. The fish which they contain is white, delicate, fat, and of a very agreeable taste, so that it is a morsel for cardinal (*un boccone di cardinale*.) They are called dates, because the shell which contains the fish has a great resemblance to the dates of Barbary when they are ripe and dried. The stone in which they are enclosed is heavy and pretty solid, though it appears spongy. The cavity which the shell occupies in the stone, and which it exactly fills, touches it on all sides like the best fitted case. Some small ones are not half an inch in length, but others are four inches. When the fishermen had procured a sufficient number of the stones, they placed them on the edge of the quay, and broke them by means of a large hammer. In some they found nothing, but others contained two or three dates. They gave some of them to me, together with fragments of the stone which enclosed them, and on which I made the above observation."

Instances of a similar kind may be found also in various other works. Thus we are told that Charles Hall, a merchant at Eberach, saw a living toad sitting in a stone, upon its being broken. Martin Weinreich relates a circumstance of the like kind; and John Nardius says, that he found in a block of marble a living snake. Libavius speaks of vipers and toads found in stones, as does also Cardan. A living toad was found in an oak by Seigne in 1731, and another in a hard stone, at Ecretteville, by Le Prince in 1756.

A great many particulars relating to this subject have been collected by Guettard. A common toad, two of whose feet were free, and the other two sticking fast in gypsum, so that it was impossible to disengage them without tearing them to pieces, was sent to him by order of the Duke of Orleans.—Count Herman II. of Hartzfeld, told Dr. Sachsen that he heard a living frog croak in the middle of a stone at his palace of Schellenberg, near Cologne, and that the animal hopped out on the stone bursting of itself.

In the year 1753 a living toad was found by J. M. Graberg in a solid hard block of stone, dug up from a quarry in the parish of Wamblingebo, in Gothland, and which he caused to be broken by the workmen. The colour of the animal was blackish grey, a little spotted on the back, and somewhat fainter on the belly. Its eyes were small and round, and covered by a tender skin or film, under which they seemed to sparkle a little with a colour like that of pale gold. Having touched it on the head with a stick, it contracted its eyes as if it had been asleep; as soon as the stick was removed, it gradually opened them; but moved neither its body nor feet in the least, though he touched it different times. He remarked also that the mouth had no aperture. It was covered with a yellowish skin, which he examined also with the stick, but he was not able to make it open it. Having at last pressed it on the back, a little clear water issued from it behind, upon which it immediately died. Don Antonio

tonio de Ulloa, who, with Condamine, Bouguer, and Godin, was employed in measuring a degree of the meridian in Peru, saw at Madrid two worms which had been found in the middle of a block of marble by the King of Spain's statuary. Milson, in his Travels through Italy, speaks of a living crab being found in a piece of marble near Tivoli. M. Peyssonnel, physician to the King of France, having employed some workmen to dig a well near his house in Guadaloupe, they found living frogs amidst the strata of the rock. His curiosity being excited by this circumstance, he descended into the well himself, bored into the rock, and brought up some green frogs, which had a perfect resemblance to the common ones.

In the Gentleman's Magazine for 1756 mention is made of a living toad found in a block of marble, at an old castle belonging to Lord Tankerville, twelve miles N. W. from Alnwick. T. Whiston relates, that, in the year 1743, a stone-cutter named Charlton, found near Wisbich, in the Isle of Ely, a living toad enclosed in a piece of marble. Being called to the spot, he saw the animal and the cavity in which it was contained. The latter was something larger than the toad, and had almost the same figure. The animal was of a dark yellow colour; and the solid marble, which enclosed it on all sides, was several inches thick. It seemed to be quite healthy, and by its long confinement had not become meagre. John Malpas, also, in the year 1755, found a living toad enclosed in a piece of freestone at Great Yarmouth. The hole in which it lay was six inches distant from the corner of the stone. He took it out with a pair of compasses, but in doing so happened to hurt it. When he placed it on the ground, it, however, crept about, but died in the course of an hour. It had a yellow stripe over the back, the colour of which became changed after it was dead. No crack or cleft could be discovered in the stone. The inside of the cavity was smooth, and looked as if it had been polished.

M. Gerhard, at Padenburg, in the county of Mansfield, saw likewise a living toad enclosed in a stone. The cavity in which it lay seemed exactly fitted to the size of the animal, but was exceedingly smooth in the inside. No opening could be observed through which it was possible for it to have got into the stone. After some search, however, a hole was discovered at the surface of the earth, which extended to the depth of twelve toises; but ceased at the distance of thirteen inches above the cavity that contained the toad. M. Gerhard considers it as very probable that this aperture had formerly been extended to the cavity, into which the egg of a toad might be conveyed by water; and that the opening must afterwards have been closed up near the cavity.

The toad, however, must have remained long in this state, for such apertures do not close up soon, and a long time is required for the petrification of earthly particles.

M. le Cat, who relates many instances of the like kind, examines the possibility of them, and the causes of such phenomena. Some philosophers have been of opinion, that the eggs of these animals, created by the Supreme Being at the beginning of the world, and floating about on the watery expanse, have, since that time, been enclosed in the interior parts of the rocks. But M. le Cat contradicts this opinion by remarking, that the creation of an egg is not sufficient, and that it must be hatched in order to produce a living creature.

creature. He considers it also as impossible that such animals can be of the same antiquity as the stones or substances in which they are found. The age of the oldest men, says he, never exceeded 169 years; and what is the life of an insect when compared with that of man? Even if we suppose that the moderation of these animals, and their being exposed to very little motion, had caused their growth, and the period of their life to be extended in an uncommon degree; and though their want of air, or rather their being preserved and defended from the manifold impressions of that corrupted element, had contributed a great deal to their support, the prolongation of life thence arising could not exceed so very much their natural and usual existence. M. le Cat rather thinks that a hatched egg, in all the cases mentioned, may have fallen by chance into some small cavity, where it was secured from petrification till its substance acquired sufficient strength. He here remarks that eggs, when rubbed over with varnish so as to be defended from the effects of the air, may be preserved fruitful for years; and he therefore believes, on good grounds, that an egg so secured in the center of a rock might retain its activity for some thousands of years, and even that it would be impossible for it to be hatched till it had been exposed to a very high degree of often renewed or long continued heat. According to M. le Cat's opinion, it is the egg which is of great antiquity, and not the animal. I shall here observe that nature, when allowed peace and rest, does not require so much time as is generally believed in order to produce minerals. Of the truth of this remark I am fully convinced since I saw in the museum of Gottingen the step of a ladder found on clearing the gallery of a mine in Rammelsberg, abandoned at most about one hundred years before, and which in the course of that period had been entrusted with selenite seven inches in thickness. Nay we have instances of ore having grown up in a much shorter time.

I must observe also, that most of the animals found in this manner were of the amphibious kind, and request the reader to reflect on the habits, nature, and mode of living, peculiar to that class. Caldesi relates, that tortoises can endure hunger for half a-year; and numberless instances might be produced of their strong and tough nature.

I shall not enlarge farther on this subject at present, as I mean, at some future period, to communicate my ideas to the public in a more connected manner, and to give as complete a theory on it as possible. I flatter myself that I am the more qualified for this task, as many have written on these phenomena and formed conjectures without having ever seen one instance, while I have been an eye-witness of some of the latest. In a quarry not far from Cassel, between that city and the palace of Freyenhagen, I found three toads together in a pretty large block of freestone. I remember, also, that when a boy, our house at Cassel being under repair, and the old plaster pulled down, several toads were found between it and the stone wall.

At a period like the present, when so many things are made the subject of experiment, when every one endeavours to tread in the footsteps of a Bacon and a Newton, and, instead of being contented with surveying Nature in her private recesses, and carefully watching her progress, compels her, as it were, to labour and make known her secrets, I am much astonished that she has not been put to the

proof in this respect long ago. Such experiments, without which all theory must ever remain mere hypothesis, and can never amount to demonstration, would require little or no expence. Nothing would be necessary but to make a deep hole in a stone, to enclose some animal in it, such, for example, as a toad, and to prevent the air from penetrating to it; or eggs only might at first be put into the stone. It would, however, be attended with most advantage if several experiments were made at the same time, in order that the state of the animals might be examined at different periods. Such experiments, and careful observation of the nature and economy of these animals, could alone lead to any certain conclusion respecting a circumstance so abstruse, which, at present, seems to surpass the powers of our comprehension.

ON THE SIN OF ONAN.

ONANIA, or Onanism, are terms lately framed to denote the crime of self-pollution, mentioned in scripture to have been committed by Onan, and punished in him with death. This practice, however common, hath among all nations been reckoned a very great crime. In scripture, besides the instance of Onan above-mentioned, we find self-polluters termed *effeminate, unclean, filthy, and abominable*. Even the heathens, who had not the advantage of revelation, were of the same opinion, as appears from the following lines of Martial:

*Hoc nihil esse putes! scelus est, mihi crede; sed ingens
Quantum vix animo concipis ipse tuo.*

You think 'tis nothing! 'tis a crime, believe!
A crime so great you scarcely can conceive.

Dr. Tissot has published a treatise on the pernicious effects of this shameful practice, which appears to be no less baneful to the mind than to the body. He begins with observing, that, by the continual waste of the human body, aliments are required for our support. These aliments, however, require certain preparations in the body itself; and, when by any means we become so altered that these preparations cannot be effected, the best aliments then prove insufficient for the support of the body. Of all the causes by which this morbid alteration is brought on, none is more common than too copious evacuations; and of all evacuations, that of the semen is the most pernicious when carried to excess. It is also to be observed, that, though excess in natural venery is productive of very dangerous disorders, yet an equal evacuation by self-pollution, which is an unnatural way, is productive of others still more to be dreaded. The consequences enumerated by Dr. Tissot are as follow:

1. All the intellectual faculties are weakened; the memory fails; the ideas are confused, and the patient sometimes even falls into a slight degree of insanity. They are continually under a kind of inward restlessness, and feel a constant anguish. They are subject to giddiness; all the senses, especially those of seeing and hearing, grow weaker and weaker, and they are subject to frightful dreams.
2. The strength entirely fails, and the growth in young persons is considerably checked. Some are afflicted with almost continual watching,

watching, and others dose almost perpetually. Almost all of them become hypochondriac or hysteric, and are afflicted with all the evils which attend these disorders. Some have been known to spit calcareous matter; and others are afflicted with coughs, slow fevers, and consumptions.

3. The patients are affected with the most acute pains in different parts of the body, as the head, breast, stomach, and intestines; while some complain of an obtuse sensation of pain all over the body on the slightest impression.

4. There are not only to be seen pimples on the face, which are one of the most common symptoms; but even blotches, or suppurative pustules, appear on the face, nose, breast, and thighs; and sometimes fleshy excrescences arise on the forehead.

5. The organs of generation are also affected; and the semen is evacuated on the slightest irritation, even that of going to stool. Numbers are afflicted with an habitual gonorrhœa, which entirely destroys the vigour of the constitution, and the matter of it resembles a fetid sanies. Others are affected with painful priapisms, dysuries, stranguries, and heat of urine, with painful tumours in the testicles, penis, bladder, and spermatic cord; and impotence in a greater or less degree is the never-failing consequence of this detestable vice.

6. The functions of the intestines are sometimes totally destroyed; and some patients complain of costiveness, others of diarrhœa, piles, and the running of a fetid matter from the fundament.

With regard to the cure, the first step is to leave off those practices which have occasioned the disease: which our author asserts is no easy matter; as, according to him, the soul itself becomes polluted, and can dwell on no other idea; or, if it does, the irritability of the parts of generation themselves quickly recal ideas of the same kind. This irritability is no doubt much more to be dreaded than any pollution the soul can have received; and, by removing it, there will be no occasion for exhortations to discontinue the practice. The principal means for diminishing this irritability are, in the first place, to avoid all stimulating, acrid, and spiced, meats. A low diet, however, is improper, because it would farther reduce the body, already too much emaciated. The food should therefore be nutritive, but plain, and should consist of flesh rather roasted than boiled, rich broths, &c. It is certain, however, that, as these foods contribute to restore the strength of the body, the stimulus on the organs of generation will be proportionably increased by the semen which is constantly secreted, and which will now be in larger quantity than even in healthy persons, owing to the great evacuations of it which have preceded. Some part of the semen is gradually absorbed by the lymphatics; in consequence of which, the remainder becomes thick, acrid, and very stimulating. To remedy this, exercise is to be used, and that not only for pleasure, but till it is attended with a very considerable degree of fatigue. The sleep also must be no more than is barely sufficient to repair the fatigues occasioned by the exercise, or other employment; for an excess in sleep is as bad as idleness or stimulating foods. Excess in wine or intoxicating liquors is also to be avoided; or rather such liquors ought never to be tasted, unless as a medicine to restore the exhausted spirits: and to all this ought to be joined the Peruvian bark, which hath this admirable property, that, with little or no stimulus, it restores the tone

of the system, and invigorates the body in a manner incredible to those who have not observed its effects. If these directions are followed, the patient may almost certainly expect a recovery, provided any degree of vital strength remains; and those who desire a life of celibacy on a moral account, will find them much more effectual than all the vows of chastity they can make.

EXTRACTS FROM PARK'S TRAVELS IN THE INTERIOR OF AFRICA.

THE African native is humane and inoffensive; and, where he has had little intercourse with Europeans, exhibits that kind of being in a state of nature which philosophy loves to develope, and poetry delights in praising. Such of the natives as have been converted to Mahometanism are extremely strict in their religious observances; and the priest here, as in other countries, has a very powerful influence, which cannot be better elucidated than by the following relation of what passed at Teesee, respecting a newly-married couple:

Tiggitty Sego (the king) held a palaver (so they call a legal court or public meeting) on a very extraordinary occasion, which I attended; and the debates on both sides displayed much ingenuity.—The case was this:—"A young man, a kafir, of considerable affluence, who had recently married a young and handsome wife, applied to a very devout bushreen, or Mussulman priest, of his acquaintance, to procure him saphies for his protection during the approaching war. The bushreen complied with the request; and in order, as he pretended, to render the saphies more efficacious, enjoined the young man to avoid any intercourse with his bride for the space of six weeks. Severe as this injunction was, the kafir strictly obeyed; and, without telling his wife the real cause, absented himself from her company. In the mean time it began to be whispered at Teesee that the bushreen, who always performed his evening devotions at the door of the kafir's hut, was more intimate with the young wife than he ought to be. At first the good husband was unwilling to suspect the honour of his sanctified friend, and one whole month elapsed before any jealousy arose in his mind; but, hearing the charge repeated, he at last interrogated his wife on the subject, who frankly confessed that the bushreen had seduced her. Hereupon the kafir put her into confinement, and called a palaver upon the bushreen's conduct. The fact was clearly proved against him, and he was sentenced to be sold into slavery, or to find two slaves for his redemption, according to the pleasure of the complainant. The injured husband, however, was unwilling to proceed against his friend to such extremity, and desired rather to have him publicly flogged before Tiggitty Sego's gate. This was agreed to, and the sentence was immediately executed. The culprit was tied by the hand to a long stake; and, a long black rod being brought forth, the executioner, after flourishing it round his head for some time, applied it with such force and dexterity to the bushreen's back, as to make him roar until the woods resounded with his screams. The surrounding multitude, by their hooting and laughing, manifested how much they enjoyed the punishment of the old gallant; and, it is worthy of remark, that the number of stripes was precisely the same as are enjoined by the Mosaic Law, FORTY *save one*."

It

ON A NEW INSECT CALLED ANTIODONTALGICUS. 61

It may not be improper here, or unacceptable to our readers, to give Mr. Park's account of the mode of courtship adopted by the natives, and of their marriage-ceremony :

“ If a man takes a fancy to a woman, it is not considered as absolutely necessary that he should make an overture to the girl herself. The first object is to agree with the parents, concerning the recompence to be given them for the loss of the company and services of their daughter. The value of two slaves is common, unless the girl is thought very handsome, in which case the parents will raise their demand very considerably. If the lover is rich enough and willing to give the sum demanded, he then communicates his wishes to the damsel ; but her consent is by no means necessary to the match ; for if the parents agree to it, and eat a few *kolla-nuts*, which are presented by the suitor as an earnest of the bargain, the young lady must either have the man of their choice, or continue unmarried, for she cannot afterwards be given to another. If the parents should attempt it, the lover is then authorized, by the laws of the country, to seize upon the girl as his slave.—When the day for celebrating the nuptials is fixed on, a select number of people are invited to be present at the wedding ; a bullock or goat is killed, and great plenty of victuals dressed for the occasion. As soon as it is dark, the bride is conducted into a hut, where a company of matrons assist in arranging the wedding-dress, which is always white cotton, and is put on in such a manner as to conceal the bride from head to foot. Thus arrayed, she is seated on a mat in the middle of the floor, and the old women place themselves in a circle round her. They then give her a series of instruction, and point out with propriety what ought to be her future conduct in life. This scene of instruction, however, is frequently interrupted by the girls, who amuse the company with songs and dances, which are rather more remarkable for their gaiety than delicacy. While the bride remains within the hut with the women, the bridegroom devotes his attention to the guests of both sexes, who assemble without doors, and by distributing among them small presents of *kolla-nuts*, and seeing that every one partakes of the good cheer which is provided, he contributes much to the general hilarity of the evening. When supper is ended, the company spend the remainder of the night in singing and dancing, and seldom separate until day-break.—About midnight the bride is privately conducted by the women into the hut which is to be her future residence ; and the bridegroom, upon a signal given, retires from his company. The new-married couple, however, are always disturbed towards morning by the women, who assemble to inspect the nuptial sheet (according to the manners of the ancient Hebrews, as recorded in scripture), and dance round it. This ceremony is thought indispensably necessary, nor is the marriage considered valid without it.”

ON A NEW INSECT CALLED ANTIODONTALGICUS.

And the Property possessed by it, in common with some other Insects, of curing the TOOTH-ACHE.

PROFESSOR Gerbi, in a small work published at Florence, in 1794, gives the description and figure of an insect, which is a kind of *curculio*, that, from its property of allaying the tooth-ache, has

has received the epithet of *antiodontalgicus*, and which is found on a species of thistle, *caraus spinosissimus*, of which a figure is likewise given. This thistle is compared, by Professor Gerbi, to the thistle of Bonjarti, and is, perhaps, a variety of the *cnicus*. Its flowers, when analysed, gave the acid of galls, the muriatic acid, oxalat of lime, extractive matter, and very little resin. On the bottom of the calyx, which supports the flowers, there are often found excrescences like the gall-nut, which are at first spheroidal, afterwards cylindrical, and at length assume the figure of two hemispheres: they consist of the like component parts, but contain more resin, and far more oxalat or lime; as the gall-apple of the oak, according to the experiments of M. Branchi, which are here mentioned, contains more of the acid of galls than the bark and other parts of the oak, in which he could discover no sulphuric acid. The insect, according to the author's observations, eats not only the parenchyma, but also the vessels and fibres of the leaves. The egg, before the worm makes its appearance, is nourished by the sap of the plant, and of the above excrescences, in which it resides, by means of the attractive powers that the egg possesses for certain vegetable juices and substances. The excrescences arise by the accumulation of a solid substance, which is precipitated from the nourishing juices of the thistle, diminished by nourishing the egg and worm. This insect, the eggs of which are deposited in these excrescences, is, together with the *curculio* of the centaury, a new species. It is of a longish figure; covered below with short yellow hair, and above with golden yellow velvety spots. Its corselet is variegated with specks; and the covering of its wings with specks and stripes. It has a short proboscis, and shews some likeness to the *curculio villosus* of Geoffroy. Its larva represents a sort of ichneumon. By chemical analysis, it exhibits some traces of common salt; by distillation with a strong dry heat, some volatile lixivious salts; and it contains, besides these, some gelatinous, and a little subacious and slimy, extractive matter. If about a dozen or fifteen of these insects, when in the state of larva, or even when come to perfection, be bruised and rubbed slowly between the fore-finger and thumb until they have lost their moisture, and if the painful tooth, where it is hollow, be touched with that finger, the pain ceases sometimes instantaneously. This power or property the finger will retain for a year, even though it be often washed and used. A piece of shamois leather will serve equally well with the finger. Of 629 experiments, 401 were attended with complete success. In two of these cases the hollow teeth arose from some fault in the juices; in the rest they were merely local.

If the gums are inflamed, the remedy is of no avail. According to Professor Gerbi, the hollowness in the teeth arises from an acrid matter which irritates the nerves, and which is neutralised by the juices of the insect.

This property of curing the tooth-ache has been discovered in other insects, as appears by a paper of Dr. Corradori, inserted in the *Giornale fisico-medico* of Brugnatelli, Part I. The experiments were made in the town of Prato, where the property of some insects to cure the tooth-ache had been known among the peasants, even before any thing was published on the subject by Gerbi and Comparini. A certain Luigi Mari is here made to assert, that he laid hold of about a dozen of these insects with his fingers, and heaped
them

them over each other, by which means his fingers, for a whole year, though he daily washed his hands, were endowed with the property of curing the tooth-ache, by merely touching the affected tooth. The author of the letter affirms, that the following method will always afford relief. The insect described by Rossi, in his *Fauna Etrusca*, under the name of *Carabus chrysocephalus*, is to be held for some minutes between the thumb and the fore-finger, and the diseased tooth and the gums are to be afterwards touched with that finger. If the pain does not cease on the first touching, the finger is to be well dried, and must be applied to the insect again, and then to the tooth; and this is to be continued alternately till the pain ceases entirely. M. Cypriani asserts, that he cured every case of the tooth-ache, without exception, by this method, within the space of eight or nine minutes.

More insects possess the like property, and experiments made with the following were equally successful. The *carabus ferrugineus* of Fabricius; the *coccinella septem punctata* (the lady-bird); the *chrysomela populi*, and the *chrysomela sanguinolenta*. It would appear that this property belongs to various kinds of the *coleoptera*.

The idea of these insects being endowed with the property of curing the tooth-ache is not confined to Italy; for Dr. Hirsch, dentist to the court of Weimar, asserts, in the *Verkundiger*, Sept. 24, 1798, that he employed them with the happiest effect, except in some places where his patients were females. Dr. Hirsch says, that he took that small insect, found commonly among corn *coccinella septempunctata*, and bruised it between his fingers.—He then rubbed the fingers with which he had bruised it till they became warm at the points, and touched with them the unsound parts of the gums, as well as the diseased tooth. Dr. Hirsch adds, that he made the same experiment a few days after, with equal success, though he had not bruised a new insect with his fingers. He seems to think, though the other authors we have quoted do not mention the circumstance, that to insure the efficacy of the process the insect should be alive; because, when dead, its internal parts, in which he presumes the virtue chiefly resides, become dried up, leaving only the wings and an empty shell; and therefore proposes to physicians, to turn their attention to the finding out some method for preserving the virtue of the insect, so that its efficacy may be in full vigour throughout the year. An English practitioner has proposed, that impregnated shamois leather should be imported by the way of Leghorn; but the virtue seems to belong to several *coleoptera* in this country, such an importation is unnecessary. The impregnating of leather (other substances might also be tried) by rubbing it with the insects, seems a good way of realising what has been proposed by Dr. Hirsch.

While on the subject of tooth-ache, we may add the following:—A lady to whom charcoal-powder was recommended as a dentifrice, was subject at times to violent tooth-ache, from one of the *dentes sapientiae* that was become carious. She one day, when in great pain, filled the cavity of the tooth with the charcoal dentifrice, and was surprised to find herself in a few seconds free from pain. It might probably be urged, that any substance filling the hollow of the tooth mechanically, and thereby preventing the access of atmospheric air, would produce the same effect: but the physician who attended the

the lady attributes the *temporary* good effect experienced in this case to the power of the charcoal.

MANNER OF FOWLING IN ST. KILDA, IN THE HEBRIDES.

THE art of the St. Kildians at catching fowls under the cloud of night is truly astonishing, and their success no less wonderful.

A man from that island told the writer of this, that he was one of four men that caught four lints, or pens, being three hundred each, in the whole 1200 solan geese, in one night. That bird, after the hard toil of the day at fishing without intermission, rising high in the air to get a full sight of the fish that he marks out for his prey before he pounces upon it, and each time devouring it before he rises above surface, becomes so fatigued at night that he sleeps quite sound, in company with some hundreds, who mark out some particular spot, in the face of the rocks, to which they repair at night, and think themselves secure under the protection of a centinel, who stands awake to watch their lives, and give the alarm by *bir, bir*, in time of danger, to awaken those under his guard.

The St. Kildians watch with great care on what part of the island these birds are most likely to alight at night; and this they know by marking out on which side of the island the play of fish is, among which the geese are at work the whole day; because in that quarter they are ready to betake themselves to sleep at night. And, when they are fairly alighted, the fowlers repair to the place with their panniers, and ropes of thirty fathoms in length, to let them down with profound silence in their neighbourhood—to try their fortunes among the unwary throng.

The fowler, thus let down by one or more men, who hold the rope lest he should fall over the impending rocks into the sea, with a white towel about his breast, calmly slides over the face of the rocks till he has a full view of the centinel; then he gently moves along on his hands and feet, creeping very silently to the spot where the centinel stands on guard. If he cries *bir, bir*, the sign of an alarm, he stands back; but if he cries *grog, grog*, that of confidence, he advances without fear of giving an alarm, because the goose takes the fowler for one of the straggling geese coming into the camp, and suffers him to advance. The fowler very gently tickles one of his legs, which he lifts and places on the palm of his hand; he then as gently tickles the other, which in like manner is lifted and placed on the hand. He then no less artfully than insensibly moves the centinel near the first sleeping goose, which he pushes with his fingers, on which he awakes, and, finding the centinel standing above him, he immediately falls to fight him for supposed insolence. This alarms the whole camp, and, instead of flying off, they all begin to fight through the whole company; while, in the mean time, the common enemy, unsuspected, begins in good earnest to twist their necks, and never gives up till the whole are left dead on the spot.

This goose is almost as large as a land goose, of a white colour, except the top of the wings, which are black, and the top of the head, which is yellow. The bill is long and sharp pointed, extremely hard, and pierces an inch deep into wood. There is an act of parliament against the cruel manner of fastening herrings on planks far out to sea, to catch those darling geese, and a severe penalty on transgressor

gressors of this humane act. A well-supported fact concerning the strength of this fowl, is told by one of the tacksmen of this island. Once when sailing towards St. Kilda, and entering upon a field of sea, where the geese were busy darting among the fish from on high, on each side of the large barge on which he sat, and sailing fast before the wind, the barge passed over a fish so quickly that a goose who had marked it out, and rushing so violently through the air, instead of the fish, on account of the unforeseen accident, darted his strong bill quite through the barge, and was actually carried back dead, with his bill through the plank, as a testimony of the fact.

The nests of the solan geese, not to mention others, are so very close, that, when one walks between them, the hatching fowls on either side can always take hold of one's clothes; and, says Mr. Martin, will often sit still till they are attacked, rather than expose their eggs to be destroyed by the sea-gulls. Their mates furnish them with food while they hatch.

The season for catching the old solan geese, is before they begin to lay. About the middle of May is the time of gathering their eggs. —The young solan geese are larger than their mothers before they begin to fly, being extremely fat. The fat on the breast is very deep. The grease is kept in bags made of the stomach of old geese. They have never but one egg at a hatching, in any nest at St. Kilda. They lay again, and even a third time, if deprived of the first egg. The solan goose can carry five herrings at a time to his mate or young, and spew them out of his gorget into the nest. This fowl digests so quickly, that instances are given when the bird was shot immediately as he appeared above the surface; and the fish was found half digested in his stomach, that was just devoured below.

OF THE INFLUENCE OF SNOW AND RAIN IN VEGETATION.

ALL those who inhabit parts of the earth exposed to snow, agree in considering this meteor as one of the means employed by nature to give to plants more strength, and to make them expand with more vigour. Several even are persuaded that winters which produce no snow preface a bad harvest and a feeble state of vegetation; and they ascribe its influence to the salts which they say exist in that congealed water. Snow collected in large masses, melted and evaporated in earthen vessels, having left no residuum, has made this supposition be considered as a mere chimera; and, in consequence of reasoning carried too far, some have been induced to deny that snow has any influence at all on vegetation.

In phenomena transmitted through successive generations, we must distinguish the results of observation from the explanations some have attempted to give of them. There are phenomena, indeed, the whole of which present themselves to our senses in their full force, and which can leave no doubt in the mind of the least attentive observer; but there are others which exhibit only a few traces that cannot be distinguished, unless by particular instruments, or after a series of observations often repeated. When these traces have been observed by a great number of individuals, for several generations, however incorrectly transmitted, and however obscure may be the tradition, the philosopher must beware of deciding too rashly. The greater the number of observers, the more perfect is

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the uniformity of their opinions respecting the phenomenon, and the more careful ought people to be in their discussions before they venture to contradict them.

The influence of snow on vegetation has been subjected to the examination of too many observers, to allow us to believe it possible that there could be so great an uniformity in their opinions, were not the effects really such as are supposed. In this memoir, then, I shall examine these effects; I shall endeavour to explain the cause of them, and shall enquire what relation there is between the explanation given long ago by farmers and a more accurate analysis of snow.

That, after a very cold and very severe winter, vegetation is stronger and more active in proportion as plants have been covered with a greater depth of snow is a certain fact, proved by the result of the experience of every one engaged in agriculture. The cause is simple and natural. All plants are capable of supporting cold in a less or a greater degree; there are some which cannot be exposed to the temperature of melting ice without perishing, and there are others on which the most intense cold produces no alteration. Each plant then has certain limits to its resistance of cold; a certain temperature beyond which it cannot be exposed to it without the danger of being frozen and destroyed. Several plants exposed to a temperature nearly equal to that which must congeal them do not perish, but, by the sharpness of the cold which they experience, contract a languishing disease, the effects of which they feel during the whole course of their existence.

If we expose to the action of great cold a series of plants capable of supporting different degrees of it, there will perish in that series a greater number in proportion as the cold has been greater; but if, by means of a covering, we intercept the cold, and prevent the plants from being exposed to a diminution of heat as great as that which exists without, several plants which would otherwise have perished will be preserved; several of those which would have been diseased will be healthy and vigorous, and their number will be greater in proportion as the covering has intercepted a greater degree of cold.

The earth has a heat accumulated in its interior parts: this heat is perceived in all subterranean places of sufficient depth to prevent the external cold or heat from penetrating thither. This temperature is equal to 13° on the decimal scale of the mercurial thermometer, (55.4 Fahr.) Snow is a bad conductor of heat; cold penetrates it with difficulty, and its temperature when it melts is zero (0). When the surface of the earth is covered to a considerable depth with snow, the cold of the atmosphere, in contact with it, tends to cool its mass; and the internal heat of the earth tends to warm it. Through the mass of snow there is then a contest of heat and cold, the usual result of which is to melt a portion of the snow, and to carry to zero the temperature of the middle, in which the plants are situated.

Thus snow has the property of keeping the plants which it covers at the temperature of melting ice; of preserving them from the influence of a greater cold; of supplying them with continual moisture; of preventing a great number from perishing, and still more from languishing; and, consequently, of giving more strength and vigour to vegetables than they would have obtained had they not been covered with snow. It appears then that we may explain a part of

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the influence which snow has upon vegetation, without having recourse to the salts or nitre which it is said to contain, and which analysis and experiments have proved do not exist.

The explanation of the influence of snow by the continual humidity it supplies to plants, is the result of observations which cannot have escaped intelligent farmers in all ages; but a knowledge of the influence it has by being a bad conductor of heat, is the consequence of experiments recently made on caloric. The ancients had neither a series of facts nor instruments proper for such researches. They observed, that the atmosphere rusted metals in the same manner as acids; from which they concluded, that the air contained an acid. They remarked, that nitre was formed spontaneously on calcareous masses; from which they concluded, that the acid of the atmosphere was a nitre: and this conclusion was not far from the truth, since the latest experiments, and most remarkable discoveries, which have contributed in the highest degree to the rapid progress of physics, have proved that the air is formed of two elements, which enter into the composition of the nitric acid, viz. oxygen and azot. Let us acknowledge, therefore, that the philosophers who preceded us possessed no little acuteness and sagacity to be able to discover, so long ago, by the accumulation of several indirect experiments, what the most accurate analysis demonstrates at present.

If snow possessed only the property of preserving vegetables, and of preventing them from perishing by the severity of the cold, it is not at all probable that the ancient philosophers would have considered it as depositing on the earth nitrous salts, as they might have ascertained, by a very simple experiment, that it contains none of that salt; for they did not ascribe the same property to rain-water, but they remarked that snow burnt the skin in the manner of acids; as well as other bodies immersed in it. Being induced to conclude that there was nitre in the air, it was natural that they should ascribe to this nitre the burning qualities of snow, and consequently its influence on vegetation.

C. Guyton having engaged me to examine the cause of the difference of the effects of snow and rain-water on various substances, I found that they were occasioned by the oxygenation of the snow; and that these effects were to be ascribed to a particular combination of oxygen in this congealed water. I put 1000 grammes of snow in a jar, and 1000 grammes of distilled water in another. I poured into each of the jars an equal quantity of the same solution of turnsole. I placed both the jars in a warm temperature, and, after the snow melted, I remarked that the dye was redder in the snow-water than in the distilled water. I repeated this experiment, and with the same result. I put into a jar 1000 grammes of distilled water, and into another 1000 grammes of snow. Into each of the jars I put 6.5 grammes of very pure and clean sulphat of iron. In the first there was precipitated 0.150 grammes of the oxyd of iron, and 0.010 grammes in the other. As the oxyd of iron was precipitated from a solution of the sulphat by oxygen, it thence follows, that the snow contained more oxygen than the distilled water; and it follows from the first experiment, that this quantity of oxygen was considerable enough to redden the tincture of turnsole.

It is fully demonstrated by these two experiments, that snow is oxygenated water, and that it must consequently have an vegetation

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an action different from that of common ice. The experiments of Dr. Ingenhous, on the germination of seeds, have taught us that the presence and contact of oxygen are absolutely necessary for the plant to expand. They have shewn also, that, the more abundant the oxygen is, the more rapidly will the seeds grow. Most plants suffered to attain to their perfect maturity shed on the earth a part of their seed. These seeds, thus abandoned and exposed to the action of cold, are preserved by the snow which covers them, at the same time that they find in the water, it produces by melting, a portion of oxygen that has a powerful action on the principle of germination, and determines the seeds that would have perished to grow, to expand, and to augment the number of the plants that cover the surface of the earth.

A very considerable number of the plants which we have the art of appropriating for our nourishment and our wants are sown in the months of Vendemiaire, Brumaire, and even Frimaire, (end of September to end of December ;) several of these seeds germinate before the cold commences its action upon them and changes the principle of their life. The snow which covers the rest, acting on the germ by its oxygenation, obliges them to expand and to increase the number of useful plants which the farmer and gardener commit to the earth, and consequently to multiply their productions.

Here then we have three effects of snow upon vegetation, all very different, which contribute each separately to increase, every year, the number of our plants; to give them more vigour, and consequently to multiply our crops. These effects are: 1. To prevent the plants from being attacked by the cold, and from being changed or perishing by its force. 2. To furnish vegetables with continual moisture, which helps them to procure those substances necessary for their nutrition, and to preserve them in a strong healthy state. 3. To cause a greater number of seeds to germinate, and consequently to increase the number of our plants.

Before I conclude, I must mention some important experiments, in regard to vegetation, which I made on rain-water. Rain-water does not act on tincture of turnsole or on sulphat of iron like snow; from which it would appear that it does not participate in that property which it acquires by oxygenation. Rain-water, however, contains oxygen also; but in a state of solution, and not of combination, as in snow; for under an exhausted receiver rain-water suffers air to escape from it, which contains proportions of oxygen much greater than river-water, spring water, and even atmospheric air.

Atmospheric air exposed to the action of phosphorus, without the application of heat, after the method indicated by Berthollet, is diminished in its bulk 0.20; that is to say, the phosphorus takes from the azot 20 parts of oxygen in 100 parts of atmospheric air. Air drawn from the water of the Seine, tried by the same eudiometer, gave the same diminution. Air drawn from rain-water was, on the other hand, diminished by phosphorus from 0.32 to 0.40. As the mean of a great number of experiments was 0.35, it thence follows that the proportion of oxygen in the air obtained from rain-water, newly fallen, is greater and more considerable than that contained in atmospheric air, and in the air of other water.

Since rain-water thus differs from common-water by the oxygen it holds in solution, and since oxygen has an influence on germination, and

and even on vegetation, as is proved by the experiments of Ingenhousf and Senebier, it is natural to ascribe to it a part of the peculiar action which rain has on the vegetation of plants different from that of other water with which they are watered. J. H.

BUONAPARTE'S EXPEDITION.—Continued from p. 20.

HITHERTO Buonaparte seemed to have carried things with a high hand; but his defeat before the walls of Acre in Syria has been so complete, that in our next we may probably have to conclude with an account of the total extermination of the French in that quarter.—The following are the particulars since our last:

CONSTANTINOPLE, *June 10, 1799.* The consul of his Britannic majesty, at Smyrna, dispatched on the 7th inst. a courier extraordinary to Mr. Spencer Smith, who arrived this morning with the confirmation of the victory obtained by Ghezzar Pacha over Buonaparte, under the walls of Acre, in which Sir Sidney Smith particularly distinguished himself. The English minister immediately communicated the intelligence to the Reis Effendi, who transmitted it to the kamaican, by whom the sultan was informed of it.

It is impossible to describe the joy felt on this occasion by the court and the public. Private letters state, that all communication between Buonaparte and his troops in Egypt is intercepted. The Grand Vizier, who is on his march to Syria, was yesterday at Nicomedia. Seid Ali, who commanded in Egypt before the invasion of the French, is arrived from Aleppo, in this capital. He was wounded in two engagements with Buonaparte, in one by a musket-ball, which passed through his shoulder, and in the other by a bayonet. He was immediately on his arrival introduced to the honours of audience with the Grand Signior, and received with marks of the highest esteem.—Presents of considerable value, and large sums of money, have been given him, to compensate for his immense losses at Cairo. He was yesterday promoted to the rank of Pacha of Three Tails, with the title of Pacha-general of Egypt.

JUNE 18. This day the Porte officially imparted to the foreign ambassadors the report of Ghezar Pacha, respecting Buonaparte's defeat. In besieging Acre, the French, by their mode of firing, had succeeded in making a breach sixty feet wide. The bravery of the Turkish garrison was eminently conspicuous, and the number that fell is far from being inconsiderable; several English officers were also killed.

We are fearful that in our loss is to be included the gallant Major Frederic Perrin, of the Turkish artillery, who is said to have fallen in the enemy's trenches, together with two midshipmen of *le Tigre*. The conduct of the British, particularly Sir Sidney Smith and Capt. Miller, is spoken of by our allies in terms of the highest admiration. The deplorable state to which the French are reduced, in consequence of Sir Sidney's having captured their flotilla, may be conceived from the circumstance of their being obliged to fire stones at *le Tigre*, during the action, which, however, did our ships but inconsiderable damage. We are happy to state, that Lieut. J. W. Wright, of *le Tigre*, who so highly distinguished himself, and who had received two musket balls through the upper part of the arm, is in a fair way of recovering.

St.

St. Jean d'Acre, on the coast of Syria, is fortified with a wall of very moderate strength, having only one gate, and is a pretty large town, but many of the houses are empty; the population is estimated by a late traveller, Mr. Brown, at between 15 and 20,000. There remains part of a double fosse, which extended round the town, but is daily dilapidated for modern erections. It has no castle nor other relique of antiquity.—Acre stands on a promontory near a small gulph. It has no haven: vessels anchor in favourable weather near the shore; but the European ships opposite Haifa, a small place at the foot of Mount Carmel, where the water is generally smooth. The trade of the place is pretty considerable: the Europeans carry thither broad cloth, lead, tin, and various other articles, and take away cotton in return.

Letters have been received from Sir Sidney Smith, written after the eleventh assault upon Acre. They state the French army to be in such a state of distress that it was highly improbable another assault would be attempted. During that assault, 100 Frenchmen, with a general at their head, succeeded in penetrating as far as the court-yard of the governor's house. They were, to a man, cut off by the English. The breach was fifty feet wide, and in it fell the flower of the French army. Certificates of good behaviour at the battle of Lodi, and on other occasions, were found in the pockets of many of the slain. Sir Sidney writes, with respect to the garrison, that the Turkish troops were at first staggered by the tremendous fire of the enemy, but that they soon recovered from their terror, and behaved with the greatest bravery. The garrison suffered greatly by fatigue, it being constantly under arms. Mons. Phillipeaux, of the engineers, who assisted Sir Sidney Smith in escaping from the Temple, died of fatigue.

A letter from a young French officer, one of the party employed in demolishing the French intrenchments, states, that previous to Buonaparte's retreat, he made a twelfth and very feeble attack; and that Sir Sidney had failed, in the Tigre, towards Joppa, in the hope of reducing it, and intercepting Buonaparte.

It is a curious circumstance that the train of artillery employed in the defence of Acre was that intended for its reduction by Buonaparte, and that the one with which he endeavoured to reduce it was that sent by the Grand Signior for its defence, but was intercepted by the French.

VIENNA, (Court Gazette,) June 20. According to the official report, received from Acre at Constantinople, from Ghezar Ghaza Ahmed Pacha, then governor of Saida and Syria, and likewise seraskier or general in chief of all the troops in that country, Gen. Buonaparte entirely ceased since the beginning of May to fire upon the fortrefs, while the garrison continued, by order of Ghezar Pacha, to harrafs the enemy day and night from the redoubt, before the city, and by several little forties.

On the 6th, a Turkish flotilla arrived in the road of Acre, with the auxiliary corps from the Porte, under Merabut Zade, Hassan Beg, and Capigi Ismael Beg, collected at Rhodus. They began that very night to land some troops and to reinforce the principal forts of Acre. The enemy, aware of this reinforcement, poured a terrible shower of balls from all their artillery upon the fortrefs during the same night; on the next day, while all the troops, newly disembarked,

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embarked, were just preparing for a general sortie in concert with the garrison, they attacked a tower called Aly Burgi, which they had burnt before. But all the French who penetrated there were so warmly received by the Mussulmen, that, with the help of God, not one escaped the sword, not to mention the great number killed by the well-directed fire of the artillery, and the discharge of musquetry of the besieged.

Only one Frenchman was kept alive till his deposition was taken, from which it clearly appeared, that Buonaparte had artfully made his soldiers believe, "That he had invaded Egypt and Syria, with the previous knowledge and consent of the Porte, in order to put an end to the government of the pretended rebellious beys in Egypt, and to that of Ghezar Pacha in Syria; adding, that the commanders of those troops sent apparently to relieve the said Pacha, but in reality to assist him, Buonaparte, were in the secret, and would at the first approach of the French seize on and deliver his person to them, so that the fortrefs would certainly surrender, and perhaps without firing a single shot."

The next evening, at eight o'clock, the enemy renewed their attack upon the same half-burnt tower, in hopes that the Turks would not be able to hold out, and from a desire to revenge the disgrace and loss of the preceding day. But all the assailants were again cut in pieces by the brave defenders, and Buonaparte's hopes frustrated a second time.

Desperate from these repeatedly frustrated attempts, Buonaparte resolved the next day upon a new storm; but was, however, again beaten off, with great loss to the French, for all who penetrated were cut in pieces.

The following days, till the 21st of May, the French general only annoyed both the fortrefs and its towers by a continual and very brisk fire of artillery. This induced all the troops in the fortrefs to a general sally, in which an immense number of the French were partly cut to pieces, partly dispersed, and, by the help of the Almighty, so completely defeated, that Buonaparte was forced to set fire to his own camp and baggage, and to retreat with the small remains of his troops, under the cover of the night, to the environs of Jaffa. Ghezar Pacha ordered his cavalry to pursue the flying enemy, and dispatched necessary instructions to several places, to cut off, if possible, or obstruct, the road on which the French retreated. Meanwhile, the Seraskier Pacha forwarded the heads of thirteen French generals and chiefs, and of about three hundred commissioned and non-commissioned officers, to the Porte, at Constantinople, where they arrived on the 12th of June, and were put up, the next day, agreeable to custom, in front of the principal gate of the Grand Signior's palace, (Babi Humajum,) with an inscription of the above event, publicly exposed to the inhabitants of that city.

A pamphlet has just been published at Paris, under the following title, "Account of the Expedition to Egypt, with the Description of several of the Monuments of that Country, by Charles Norry, member of the Philotechnique Society, and one of the architects of the expedition."—This little work is not only written by a person who accompanied the expedition through all the chances of the route, until the conquest of the country was completed, but who, possessing

possessing a cool judgment, views things as they are, and describes them without disguising them with ornaments. Citizen Norry, being one of the first of the men of science who have returned from the expedition, was of course tormented with questions by all those who, from motives of interest, whether public or private, turn their views towards Egypt. He has, therefore, very properly determined to reply to them all at once by publishing this pamphlet.

It may well be supposed that he relates many facts already known to the public, but C. Norry passes over them so rapidly that he is never tedious. It is frequently to be regretted that he has not been more minute in his details, but that would have made his pamphlet a volume, which he did not intend.

The object which would naturally attract the first attention of the architect was Pompey's Pillar, but which is with more reason attributed to Septimus Severus. This was the last monument which he examined before he returned to Europe. We shall quote the account which the author gives of the means by which he reached the summit of the column. "The few attempts which have been hitherto made to measure Pompey's Pillar, and the imperfect manner in which they have been related by different authors, induced Citizens Dutertre, Protin, Lepere, and myself, to endeavour to take all its dimensions. Citizen Dumanoir, the commandant of the port, whom we had engaged to furnish us with some blocks and cordage from his ship, hastened to second our views. On the 14th Fructidor, we proceeded with an escort to the column. We began our operations, like some English travellers on a former occasion, by setting off a paper kite of about four feet long, to which a second cord was fixed, which was seized by one of us when the kite was above and beyond the capital of the column; by pulling this cord the kite was brought to the ground, and the first cord passed over the capital. This being done, a rope, sufficient to bear more than the weight of a man, was fixed to one of the ends of the cord and substituted in its stead. A sailor then ascended to the top of the column. The first thing he did was to throw down a vane of plate-iron which had been placed upon it in 1789 by Fauvel, a French engineer. There was an inscription on this vane, which stated the total height of the pillar to be 88 feet 9 inches. When the sailor had made fast the cordage to the volutes of the angles of the capital, and carefully attached to it some of the ship-blocks, I seated myself on a little plank which was suspended from this tackle, and was soon hoisted up to the top of the pillar." The author then gives an account of the means that were taken to measure the height of the different parts of the pillar and its diameter. Several members of the committee of arts were present, the greater part of whom also ascended. "There were six or seven of us," says Citizen Norry, "on this enormous capital." In another place he says, that the column is the most colossal that is known. He is not, however, ignorant that Trajan's pillar at Rome and the monument at London are much higher. It even appears, that the column of Pompey does not equal in height that which Catherine de Medicis erected at Paris in 1572, and which is still to be seen in the corn-market; for it is 94 feet 8 inches high, while Citizen Norry, after the most exact measures, states the Egyptian column to be 23 metres 73 centimes, or 88 feet 6 inches: but the column of Pompey is remarkable for its shaft, or the portion included between the

the base and the capital, which is formed of one entire piece of Theban granite, 2,048 metres or sixty-six feet long. This extraordinary circumstance has, perhaps, induced the author to use the expression—"the most colossal known." [The reader will observe that all the measures mentioned here are French.]

Our traveller is not so particular in his account of the pyramids. He however, performed, what has been found very difficult by all travellers. Notwithstanding the great heat, which was about thirty degrees, we ascended," says he, "the steps of the great pyramid, and in about thirty-five minutes we arrived at the top. Much fatigued, we seated ourselves on the summit, and examined with curiosity, mingled with astonishment, on one side the immense deserts, bounded only by the horizon, on the other the Nile flowing through extensive and smiling plains; beyond these the rugged mountains of Mokattam stretching towards the Red Sea: in the distance the pyramids of Saccara, situated in the plain of the Mummies, in the front of the ancient Memphis, and in the fore-ground the head of Lake Mœris."—It is unfortunate that in all excursions to examine the curiosities of Egypt, it is always necessary to be accompanied by an escort, as a security against the attacks of the Bedouin Arabs—that independent race of men, whom no government has been able to subdue, and who fly to the sandy deserts whenever they are subdued. Citizen Norry, who calculates the total number of these Arabs in Egypt at thirty or 40,000, thinks it would be possible to civilize the greater part of them, and to subdue the rest by engrossing entirely the trade in sulphur, which is all imported. They would then no longer be able to procure powder, and from the moment that they should cease to attack with advantage they would be deprived of their principal resource, which is pillage.

The testimony of Citizen Norry accords with that of the latest travellers, with regard to the women who are in the harems of the rich men of the country.

"We had occasion," says he, "to see some of these women, not in the houses of the Turks, but in those of our generals, who had collected them, after the flight of the beys: these beauties, so much celebrated, are almost all excessively fat, destitute of elegance, grace, and all freedom of carriage.

"The caravan of Abyssinia had just arrived; it brought young black slaves to be sold in the Bazards, destined for this barbarous commerce. We went to see these unfortunate creatures, who were lying naked on the ground. They were employed in bruising a little corn with stones, in order to make cakes. Several Frenchmen bought some of these blacks; but General Buonaparte issued a proclamation, prohibiting the purchasers to sell them again."

The following is the description which the author gives of the banks of the Nile, when he sailed down that river to Alexandria, on the 29th of Vendemiaire: "I enjoyed the delightful pleasure of admiring the banks of this river, the waters of which, at this time, began to decrease. I remarked the inhabitants of the villages, who assembled on each side, examined us with much curiosity as we passed. Hundreds of young girls were employed in filling large vases with water, which they carried on their heads: before they entered the river, they tucked up all their clothes to their middle, but took great care to conceal their faces. Sometimes they swam across the

river, putting all their clothes, which are few and light, round their heads in the form of a turban. The husbandmen tilled the ground with ploughs of the simplest structure, drawn by oxen:—Young men entirely naked strewed the grain along the furrows—herds of the finest cows and buffaloes, and flocks of black and white sheep with the richest fleeces, and with horns twisted like the cornu ammonis, grazed in the meadows.”

The following is a copy of Sir Sidney Smith's correspondence on the subject of the siege of Acre.—To Rear-admiral Blanket, commanding his majesty's ships in the Red Sea, and to J. Wilson, Esq. agent to the Hon. East-India company, appointed by the governor and council of Bombay, dated Tigre, St. Jean d'Acre Bay, May 16, 1799.

Your letter of the 27th February, from Judda, announcing your mission from the hon. governor in council of Bombay, has reached me here.

Buonaparte, finding his popularity and his resources to diminish in Egypt, made an incursion into Syria, in hopes to make himself master of the treasure amassed by Gezar Pacha, and having taken Gaza and Jaffa, after a feeble resistance, advanced to this town, which he laid siege to on the 18th of March last. The Pacha having sent me timely information of his approach, I hastened to this anchorage, and arrived before the French army had time enough to put the place in a state of defence to resist Europeans.—I was enabled to furnish Gezar Pacha with heavy guns and ammunition, without dismantling the ships, having the good fortune to intercept Buonaparte's battering train of artillery on-board his flotilla from Alexandria and Danietta, the whole of which, to the number of eight sail, while they were a great loss to the enemy, afforded us the most effectual means of annoying them in their approaches. The town standing on a rectangular point of land, in the form of a square, of which, two sides are washed by the sea, his majesty's ships could likewise afford the protection of their guns to the garrison, and to the working parties detached from them, to throw up two ravelins, which taking the enemy's nearest approaches in flank, have considerably impeded his operations. It would be endless to enter into the detail of the events of this most singular siege; suffice it to say, we have been within a stone's throw of each other for near two months. The enemy having very early made a lodgment on the crown of the glacis, and mined the tower, forming the inland angle of the town wall (which is composed of curtains and square towers, after the manner of the 12th century), Buonaparte having transported cannon from Jaffa, and effectuated a breach the 14th day of the siege, attempted to storm, and was repulsed; since which he has made no less than eleven desperate attempts to carry the place by assault, in each of which he has been unsuccessful, and obliged to retire with the loss of the flower of his army, and eight general officers killed and wounded.

The army, totally dispirited and worn down with fatigue and disease, refused to mount the breach any more over the putrid bodies of their companions; they were consequently paraded yesterday, and furnished with shoes and water-gourds to enable them to cross the desert again. My emissaries in the French camp inform me that Suez is mentioned there as the object of Buonaparte's speculation,

though without any hopes of a disgusted, diminished, and exhausted, army, ever reaching it, at least in a state to act offensively. It is, however, my duty to notify this possible intention to you for your government. I am taking measures to cause an active and harassing pursuit.

I trust to hearing from you by all possible opportunities through Egypt, as well as by way of Aleppo. I shall of course endeavour to keep you informed of what passes on this side the isthmus.

JOFFA, May 30.—I wrote to you *via* Aleppo, on the 16th instant. I am enabled to send this duplicate of my letter by the good offices of Ismael, pacha of Jerusalem, whom I have the satisfaction on of joining here, in the pursuit of Buonaparte's beaten and retreating army. He was obliged to raise the siege of Acre on the 20th: knowing his intentions as above-mentioned, I preceded his van column as far as Gaza, in his march along the beach, and harassed it where it turned inland, but not unmolested by the Arabs. The pride of the vanquished ci-devant conqueror not allowing him to make the natural overture in favour of his wounded, after having closed all intercourse by an insolent letter to me, for fear of the consequences of the general defection of his army, he carried these poor wretches to this place by land, where it being found impracticable to carry the worst of them farther, they were embarked on-board all the vessels to be found here, together with his twelve and eight pounders cannon and howitzers, which were found too heavy for land-carriage in the sand. These vessels were sent to sea, to proceed to Damietta, without water, provisions, or seamen to navigate them, which I must attribute to precipitation and want of arrangement, rather than any thing else. Be this as it may, those poor wretches who could move, decided to steer strait for us, in perfect confidence of our affording them the good offices of humanity, in which they were not disappointed. We are thus put in possession of the twelve-pounders by which the first breach was made; as to the twenty-four, eighteen, and mortars, which made the last, they lay scattered along the road with the dead and dying, the whole way between Acre and this place. The remnant of this mighty host is creeping towards the confines of Egypt, in such a state, that, if the grand army could but come up with them, they would fall an easy prey. Buonaparte trusts to meeting reinforcements from Grand Cairo; but I have, I hope, found occupation for the portion of his army left there; so that whatever part of his force reaches Suez, it cannot be formidable to India. Be pleased to forward a duplicate of this letter to Captain Wilson, at Judda, for the information of the government in India.

W. S. SMITH.

This singular concatenation of circumstances which have brought Buonaparte and Sir Sidney Smith as it were in contact, renders every former intercourse between them an object of more than common curiosity. When Sir Sidney was in the prison of the Temple, he drew up a state of his case, which was handed to Buonaparte, on his arrival at Paris, by Madame Tallien, in the presence of Gen. Kilmaine, and some other officers.—Buonaparte expressed a strong sense of the hardships sustained by Sir Sidney, whose case, he said was not distinguishable from that of any other prisoner of war. Had he been his prisoner, Buonaparte said, he should certainly claim him of the directory; but, as the matter stood, he saw no way in which

he could possibly interfere. The fact was, that the redoubted general was afraid of the suspicion of British gold and British influence, which was then the hacknied cry, and he therefore basely declined to do that which his sense of right must have justified.

Copy of a Letter from Sir William Sidney Smith, Knt. Captain of his Majesty's ship Tigre, to Evan Nepean, Esq. dated Acre, May 3.

Sir, I have the honour to enclose you copies of my letters to Earl St. Vincent, of the 7th of April and 2d inst. for the information of my lords commissioners of the admiralty; as also a sketch of the position of the forces. The enemy have made two attempts since yesterday morning to force the two English ravelines, but were repulsed with loss. The works have now cannon mounted on them, and are nearly completed. We have thus the satisfaction of finding ourselves, on the 46th day of the siege, in a better state of defence than we were the first day the enemy opened their trenches, notwithstanding the increase of the breach which they continue to batter with effect; and the garrison, having occasionally closed with the enemy in several sorties, feel greater confidence that they shall be able to resist an assault, for which they are prepared.

APRIL 7. I have the honour to inform your lordship, that as soon as the return of fine weather, after the equinoctial gale, allowed me to approach this unheltered anchorage, I resumed my station in the bay with the Squadron under my orders. I found the enemy had profited, by our forced absence, to push their approaches to the counterscarp, and even into the ditch of the north-east angle of the town-wall, where they were employed in mining the tower, to increase a breach they had already made in it, and which had been found impracticable when they attempted to storm on the 1st inst. The Alliance and Prize gun-boats, which had been caught in the gale, had fortunately rode it out except one; and Captain Wilmot had been so indefatigable in mounting the Prize guns, under the direction of an able officer of engineers, Colonel Phelipeaux, that the fire therefrom had already slackened that of the enemy; still, however, much was to be apprehended from the effect of the mine, and a sortie was determined on, in which the British marines and seamen were to force their way into it, while the Turkish troops attacked the enemy's trenches on the right and left. The folly took place this morning just before day-light; the impetuosity and noise of the Turks rendered the attempt to surprise the enemy abortive, though in other respects they did their part well. Lieut. Wright, who commanded the seamen-pioneers, notwithstanding he received two shot in his right arm as he advanced, entered the mine with the pikemen, and proceeded to the bottom of it, where he verified its direction, and destroyed all that could be destroyed in its then state, by pulling down the supporters. Colonel Douglas, to whom I had given the necessary step of rank to enable him to command the Turkish colonels, supported the seamen in this desperate service with his usual gallantry, under the increased fire of the enemy, bringing off Lieutenant Wright, who had scarcely strength left to get out of the enemy's trench, from which they were not dislodged, as also Mr. Janverin, midshipman of the Tigre, and the rest of the wounded. The action, altogether, speaks for itself, and says more than could be said by me in praise of all concerned. I feel doubly indebted to Colonel Douglas for having preserved my gallant friend

Lieutenant

Lieutenant Wright, whose life, I am happy to say, is not despaired of by the surgeon; we have however to lament the loss of a brave and tried officer, Major Oldfield, who commanded the *Theseus's* marines, and fell gloriously on this occasion, with two of the men under his command. Our loss in wounded is twenty-three, among which is Lieutenant Beatty, of the marines, slightly.—The Turks brought in above sixty heads, a greater number of muskets, and some intrenching tools, much wanted in the garrison. A farther attack on the enemy's second parallel was not to be attempted without a greater number of regular troops. The return of the detachment was well covered by the *Theseus's* fire, Captain Miller having taken an excellent position to that effect.

The result of our day's work is, that we have taught the besiegers to respect the enemy they have to deal with, so as to keep at a greater distance. The apprehensions of the garrison are quieted as to the effect of the mine, which we have besides learnt how to countermines with advantage.

MAY 2. The enemy continue to make the most vigorous efforts to overcome our resistance in the defence of this place. The garrison has made occasional sorties protected by our small boats on their flank with field-pieces, in which the most essential service has been performed by Lieutenant Brodie and Mr. Atkinson of the *Theseus*, and Mr. Jones, master of the *Tigre*, who commanded them.

Yesterday the enemy, after many hours heavy cannonade from thirty pieces of artillery brought from Jaffa, made a fourth attempt to mount the breach, now much widened; but were repulsed with loss. The *Tigre* moored on one side and the *Theseus* on the other flank the town walls; the gun-boats, launches, and other rowing boats, continue to flank the enemy's trenches to their great annoyance. Nothing but desperation can induce them to make the sort of attempts they do to mount a breach practicable only by the means of scaling ladders, under such a fire as we pour in upon them; and it is impossible to see the lives even of our enemies thus sacrificed, and so much bravery misapplied, without regret. Captain Wilmot was shot on the 3th ult. by a rifleman, as he was mounting a howitzer on the breach: his loss is severely felt.

We have run out a ravelin on each side of the enemy's nearest approach, in which the marines of the *Tigre* and *Theseus* have worked under a heavy and incessant fire from the enemy in a way that commands the admiration and gratitude of the Turks, as it is evident the flanking fire produced from them contributed much to save the place yesterday. Colonel Phelipeaux, of the engineers, who projected and superintended the execution, has fallen a sacrifice to his zeal for this service; want of rest, and exposure to the sun, gave him a fever, of which he died this morning. Colonel Douglas supplies his place, having hitherto carried on the work under his direction, and is indefatigable in completing it for the reception of the cannon. I must not omit to mention, to the credit of the Turks, that they fetch the gabions, fascines, and those materials which the garrison does not afford, from the face of the enemy's works, setting fire to what they cannot bring away. The enemy repair in one night all the mischief we do them in the day, and continue within half pistol-shot of the walls, in spite of the constant fire kept up from the ramparts.

W. SIDNEY SMITH.

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78 DESCRIPTION OF AMERICAN WHITE-WASHING.

An over-land dispatch from Constantinople, dated June 9, confirms the farther and entire defeat of Buonaparte before the walls of Acre: he lost six thousand men, including two hundred and eighty officers, with all his artillery, tents, &c. The loss of the Turks is stated at two thousand killed, and upwards of seven hundred wounded; that of the English at 100 killed and died by sickness and fatigue. Letters from Constantinople, by way of Hamburgh, mention, that the French general Kleber, in an attempt to obey the orders of Buonaparte, had been surrounded in the mountains of Syria, and nearly cut to pieces. The same letters mention some farther particulars respecting the accident on-board the *Theseus*, of 74 guns, off Acre; by which it appears, that a young midshipman, playing on the quarter-deck, set fire to a shell, which communicating to others, a dreadful explosion took place, which brought Capt. Miller from his cabin at the instant of a second explosion, when a piece of shell penetrated his breast, and killed him on the spot: the fire by this time communicating to other shells, they likewise burst; eighty persons were killed or wounded by the different explosions.

CONSTANTINOPLE, *July 25*. For several weeks past we have had no advices respecting General Buonaparte. It is thought he has fought his way through the deserts with the handful of men that remained from the expedition in Egypt, consisting of 1500 men at the utmost. Some accounts say, that he is still in the burning sandy desert, where, having recruited a corps of 1200 men, of different nations, he wanted to get back to Egypt, where preparations are making by Murad Bey, who is stationed with a considerable force on this side of Cairo, to endeavour to cut him off from his army, while the English will support the operations by sea. The major part of the Turkish fleet had, according to the latest advices, not left Corfu.

General Buonaparte has sent a declaration to the Grand Signior, in which he attempts to justify his conduct, alleging, that he had only acted according to the orders of the late directory; but, the present government having recalled all the French from Egypt, he was ready to take his department for France, if the necessary passports and proper escort were granted him. The Grand Signior sent him answer, that he would never forget the injury done him by the French government by Buonaparte's invasion, and that he left the latter and his troops to their fate, while, on the other hand, a considerable Turkish army was ordered against France, by way of reprisals.

Private letters received in London September 4, state, that Buonaparte had made good his retreat into Egypt, and had arrived at Cairo.

DESCRIPTION OF AMERICAN WHITE-WASHING.

Written in the Character of a Gentleman who corresponds with his Friend in England.—By Dr. FRANKLIN.

SIR, My wish is to give you some account of the people of these new states, but I am far from being qualified for the purpose, having as yet seen little more than the cities of New York and Philadelphia. I have discovered but few national singularities among them. Their customs and manners are nearly the same with those of England, which they have long been used to copy. For, pre-
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vicious to the revolution, the Americans were from their infancy taught to look up to the English as patterns of perfection in all things. I have observed, however, one custom, which, for aught I know, is peculiar to this country. An account of it will serve to fill up the remainder of this sheet, and may afford you some amusement.

When a young couple are about to enter into the matrimonial state, a never-failing article in the marriage-treaty is, that the lady shall have and enjoy the free and unmolested exercise of the rights of *white-washing*, with all its ceremonials, privileges, and appurtenances. A young woman would forego the most advantageous connection, and even disappoint the warmest wish of her heart, rather than resign the invaluable right. You will wonder what this privilege of *white-washing* is: I will endeavour to give you some idea of the ceremony, as I have seen it performed.

There is no season of the year in which the lady may not claim her privilege, if she pleases; but the latter end of May is most generally fixed upon for the purpose. The attentive husband may judge by certain prognostics when the storm is nigh at hand. When the lady is unusually fretful, finds fault with the servants, is discontented with the children, and complains much of the filthiness of every thing about her—these are signs which ought not to be neglected; yet they are not decisive, as they sometimes come on and go off again, without producing any farther effect. But if, when the husband rises in the morning, he should observe in the yard a wheel-barrow with a quantity of lime in it, or should see certain buckets with lime dissolved in water, there is then no time to be lost: he immediately locks up the apartment or closet where his papers or his private property are kept, and, putting the key in his pocket, betakes himself to flight; for a husband, however beloved, becomes a perfect nuisance during this season of female rage: his authority is superseded, his commission is suspended, and the very scullion who cleans the brasses in the kitchen becomes of more consideration and importance than him. He has no resource but to abdicate, and run from an evil which he can neither prevent nor mollify.

The husband gone, the ceremony begins. The walls are in a few minutes stripped of their furniture; paintings, prints, and looking-glasses, lie in a huddled heap about the floors; the curtains are torn from the testers, the beds crammed into the windows; chairs and tables, bedsteads and cradles, crowd the yard; and the garden-fence bends beneath the weight of carpets, blankets, cloth cloaks, old coats, and ragged breeches. Here may be seen the lumber of the kitchen, forming a dark and confused mass: for the foreground of the picture, gridirons and frying-pans, rusty shovels and broken tongs, spits and pots, joint-stools, and the fractured remains of rush-bottomed chairs. There a closet has disgorged its bowels, cracked tumblers, broken wine-glasses, phials of forgotten physic, of unknown powders, seeds and dried herbs, handfuls of old corks, tops of teapots, and stoppers of departed decanters;—from the rag-hole in the garret to the rat-hole in the cellar, no place escapes unrummaged. It would seem as if the day of general doom was come, and the utensils of the house were dragged forth to judgment.

This ceremony completed, and the house thoroughly evacuated, the next operation is to smear the walls and ceilings of every room and closet with brushes dipped in a solution of lime, called *white-wash*;

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wash; to pour buckets of water over every floor, and scratch all the partitions and wainscoats with rough brushes wet with soap-suds, and dipped in stone-cutters sand. The windows by no means escape the general deluge. A servant scrambles out upon the pent-house, at the risk of her neck, and with a mug in her hand, and a bucket within reach, she dashes away innumerable gallons of water against the glass panes; to the great annoyance of the passengers in the street.—I have been told that an action at law was once brought against one of these water nymphs, by a person who had a new suit of clothes spoiled by this operation; but, after long argument, it was determined by the whole court, that the action would not lie, in as much as the defendant was in the exercise of a legal right, and not answerable for the consequences; and so the poor gentleman was doubly non-suited; for he lost not only his suit of clothes, but his suit at law.

These smearings and scratchings, washings and dashings, being duly performed, the next ceremonial is to cleanse and replace the distracted furniture. You may have seen a house-raising, or a ship-launch, when all the hands within reach are collected together: recollect, if you can, the hurry, bustle, confusion, and noise, of such a scene, and you will have some idea of this cleaning match. The misfortune is, that the sole object is to make things clean; it matters not how many useful, ornamental, or valuable, articles are mutilated, or suffer death under the operation: a mahogany chair and carved frame undergo the same discipline; they are to be made *clean* at all events; but their preservation is not worthy of attention. For instance, a fine large engraving is laid flat upon the floor; smaller prints are piled upon it, and the superincumbent weight cracks the glasses of the lower tier: but this is of no consequence. A valuable picture is placed leaning against the sharp corner of a table; others are made to lean against that, until the pressure of the whole forces the corner of the table through the canvas of the first. The frame and glass of a fine print are to be *cleaned*; the spirit and oil used on this occasion are suffered to leak through and spoil the engraving; no matter; if the glass is clean, and the frame thins, it is sufficient; the rest is not worthy of consideration. An able arithmetician has made an accurate calculation, founded on long experience, and has discovered, that the losses and destruction incident to two white-washings are equal to one removal, and three removals equal to one fire.

The cleaning frolic over, matters begin to resume their pristine appearance. The storm abates, and all would be well again, but it is impossible that so great a convulsion, in so small a community, should not produce some farther effects. For two or three weeks after the operation, the family are usually afflicted with sore throats or sore eyes, occasioned by the caustic quality of the lime; or with severe colds from the exhalations of wet floors or damp walls.

I know a gentleman, who was fond of accounting for every thing in a philosophical way. He considers this, which I have called a custom, as a real periodical disease, peculiar to the climate. His train of reasoning is ingenious and whimsical; but I am not at leisure to give you a detail. The result was, that he found the distemper to be incurable; but after much study he conceived he had discovered a method to divert the evil he could not subdue.

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For this purpose, he caused a small building, about twelve feet square, to be erected in his garden, and furnished with some ordinary chairs and tables; and a few prints of the cheapest sort were hung against the walls. His hope was, that, when the white-washing frenzy seized the females of his family, they might repair to this apartment, and scrub and scour, and smear to their heart's content; and so spend the violence of the disease in this outpost, while he enjoyed himself in quiet at head-quarters. But the experiment did not answer his expectation; it was impossible it should, since a principal part of the gratification consists in the lady's having an untroubled right to torment her husband at least once a-year, and to turn him out of doors, and take the reins of government into her own hands.

There is a much better contrivance than this of the philosopher's, which is, to cover the walls of the house with paper; this is now generally done; and, though it cannot abolish, it at least shortens the period of female dominion. The paper is decorated with flowers of various fancies, and made so ornamental, that the women have admitted the fashion, without perceiving the design.

There is also another alleviation of the husband's distress; he generally has the privilege of a small room or closet for his books and papers, the key of which he is allowed keep. This is considered as a privileged place, and stands like the land of Goshen amid the plagues of Egypt. But then he must be extremely cautious, and ever on his guard. For, should he inadvertently go abroad and leave the key in his door, the house-maid, who is always on the watch for such an opportunity, immediately enters in triumph with buckets, brooms, and brushes; takes possession of the premises, and forthwith puts all his books and papers *to rights*; to his utter confusion, and sometimes serious detriment. For instance:

A gentleman was sued by the executors of a tradesman, on a charge found against him in the deceased's books to the amount of thirty pounds. The defendant was strongly impressed with an idea that he had discharged the debt and taken a receipt; but, as the transaction was of long standing, he knew not where to find the receipt. The suit went on in course, and the time approached when judgment would be obtained against him. He then sat seriously down to examine a large bundle of old papers, which he had untied and displayed on a table for that purpose. In the midst of his search, he was suddenly called away on business of importance; he forgot to lock the door of his room. The housemaid, who had been long looking out for such an opportunity, immediately entered with the usual implements, and with great alacrity fell to cleaning the room, and putting things *to rights*. The first object that struck her eye was the confused situation of the papers on the table; these were without delay bundled together, like so many dirty knives and forks; but in the action a small piece of paper fell unnoticed on the floor, which happened to be the very receipt in question; as it had no very respectable appearance, it was soon after swept out with the common dirt of the room, and carried in a rubbish pan to the yard. The tradesman had neglected to enter the credit in his book; the defendant could find nothing to obviate the charge, and so judgment went against him for the debt and costs. A fortnight after

the whole was settled, and the money paid, one of the children found the receipt among the rubbish in the yard.

There is also another custom peculiar to the city of Philadelphia, and nearly allied to the former. I mean that of washing the pavement before the doors every Saturday evening. I at first took this to be a regulation of the police; but on farther inquiry find it is a religious rite, preparatory to the sabbath; and is, I believe, the only religious rite in which the numerous sectaries of this city perfectly agree. The ceremony begins about sun-set, and continues till about ten or eleven at night. It is very difficult for a stranger to walk the streets on those evenings; he runs a continual risk of having a bucket of dirty water thrown against his legs; but a Philadelphian born is so much accustomed to the danger, that he avoids it with surprising dexterity.

It is from this circumstance that a Philadelphian may be known any where by his gait. The streets of New York are paved with rough stones; these indeed are not washed, but the dirt is so thoroughly swept from before the doors, that the stones stand up sharp and prominent, to the great inconvenience of those who are not accustomed to so rough a path. But habit reconciles every thing. It is diverting enough to see a Philadelphian at New York; he walks the streets with as much painful caution, as if his toes were covered with corns, or his feet lamed with the gout; while a New Yorker, as little approving the plain masonry of Philadelphia, shuffles along the pavement like a parrot on a mahogany table.

It must be acknowledged, that the ablutions I have mentioned are attended with no small inconvenience; but the women would not be induced, from any consideration, to resign their privilege. Notwithstanding this, I can give you the strongest assurances, that the women of America make the most faithful wives, and the most attentive mothers in the world; and I am sure you will join me in opinion, that, if a married man is made miserable only one week in a whole year, he will have no great cause to complain of the matrimonial bond. I am, &c.

Answer to the Above, in the Character of a Lady.—By the SAME.

SIR, I have lately seen a letter upon the subject of *white-washing*, in which that necessary duty of a good house-wife is treated with unmerited ridicule. I should probably have forgot the foolish thing by this time; but, the season coming on which most women think suitable for cleansing their apartments from the smoke and dirt of the winter, I find this saucy author dished up in every family, and his flippant performance quoted wherever a wife attempts to exercise her reasonable prerogative, or execute the duties of her station. Women generally employ their time to better purpose than scribbling. The cares and comforts of a family rest principally upon their shoulders; hence it is that there are but few female authors; and the men, knowing how necessary our attentions are to their happiness, take every opportunity of discouraging literary accomplishments in the fair sex. You hear it echoed from every quarter,—"My wife cannot make verses, it is true; but she makes an excellent pudding; she can't correct the press, but she can correct her children, and scold her servants, with admirable discretion; she can't unravel the intricacies of political economy and federal government; but he can knit charming stockings." And this they call

call praising a wife, and doing justice to her character, with much nonsense of the like kind.

I say, women generally employ their time to much better purpose than scribbling; otherwise this facetious writer had not gone so long unanswered. We have ladies who sometimes lay down the needle, and take up the pen; I wonder none of them have attempted some reply. For my part, I do not pretend to be an author; I never appeared in print in my life; but I can no longer forbear saying something in answer to such impertinence, circulate how it may.

Only, sir, consider our situation. Men are naturally inattentive to the decencies of life; but why should I be so complaisant? I say they are naturally filthy creatures. If it were not that their connection with the refined sex polished their manners, and had a happy influence in the economy of life, these lords of the creation would wallow in filth, and populous cities would infect the atmosphere with their noxious vapours. It is the attention and assiduity of the women that prevent men from degenerating into mere swine. How important then are the services we render; and yet for these very services we are made the subject of ridicule and fun. Base ingratitude! Nauseous creatures! Perhaps you may think I am in a passion. No, sir, I do assure you I never was more composed in my life; and yet it is enough to provoke a saint to see how unreasonably we are treated by the men. Why now, there's my husband—a good-enough sort of a man in the main—but I will give you a sample of him.

He comes into the parlour the other day, where to be sure I was cutting up a piece of linen. Lord! says he, what a flutter is here! I can't bear to see the parlour look like a taylor's shop; besides, I am going to make some important philosophical experiments, and must have sufficient room. You must know my husband is one of your would-be philosophers. Well, I bundled up my linen as quick as I could, and began to darn a pair of ruffles, which took up no room, and could give no offence. I thought, however, I would watch my lord and master's important business. In about half an hour the tables were covered with all manner of trumpery; bottles of water, phials of drugs, pasteboard, paper and cards, glue, paste, and gum-arabic; files, knives, scissars, and needles; rosin, wax, silk, thread, rags, jags, tags, books, pamphlets, and papers. Lord bless me! I am almost out of breath, and yet I have not enumerated half the articles; well, to work he went, and, although I did not understand the object of his manœuvres, yet I could sufficiently discover that he did not succeed in any one operation. I was glad of that, I confess, and with good reason too; for, after he had fatigued himself with mischief, like a monkey in a china shop, and had called the servants to clear every thing away, I took a view of the scene my parlour exhibited. I shall not even attempt a minute description; suffice it to say, that he had overset his ink-stand, and stained my best mahogany table with ink; he had spilt a quantity of vitriol, and burnt a large hole in my carpet; my marble hearth was all over spotted with melted rosin: besides this, he had broken three china cups, four wine-glasses, two tumblers, and one of my handsomest decanters. And, after all, as I said before, I perceived that he had not succeeded in any one operation. By the bye, tell your friend, the white-wash scribbler, that this is one means by

which our closets become furnished with "halves of china-bowls, cracked tumblers, broken wine glasses tops of tea-pots, and stoppers of departed decanters." I say, I took a view of the dirt and devastation my philosophic husband had occasioned; and there I sat, like Patience on a monument, smiling at grief; but it worked inwardly. I would almost as soon the melted rosin and vitriol had been in his throat, as on my dear marble hearth and my beautiful carpet. It is not true that women have no power over their own feelings; for notwithstanding this provocation, I said nothing, or next to nothing: for I only observed, very pleasantly, what a lady of my acquaintance had told me, that the reason why philosophers are called *literary* men, is because they make a great *litter*; not a word more; however, the servant cleared away, and down sat the philosopher. A friend dropt in soon after—Your servant, sir, how do you do? "O Lord! I am almost fatigued to death; I have been all the morning making philosophical experiments." I was now more hardly put to it to smother a laugh, than I had been just before to contain my rage; my *precious* went out soon after, and I, as you may suppose, mustered all my forces; brushes, buckets, soap, sand, limeskins, and cocoa-nut-shells, with all the powers of housewifery, were immediately employed. I was certainly the best philosopher of the two; for my experiments succeeded, and his did not. All was well again, except my poor carpet—my vitriolized carpet, which still continued a mournful memento of philosophic fury, or rather philosophic folly. This operation was scarcely over, when in came my experimental philosopher, and told me, with all the indifference in the world, that he had invited six gentlemen to dine with him at three o'clock. It was then past one. I complained of the short notice; Poh! poh! said he, you can get a leg of mutton, and a loin of veal, and a few potatoes, which will do well enough. Heavens, what a chaos must the head of a philosopher be! a leg of mutton, a loin of veal, and potatoes! I was at a loss whether I should laugh or be angry; but there was no time for determining; I had but an hour and a half to do a world of business in.—My carpet, which had suffered in the cause of experimental philosophy in the morning, was destined to be most shamefully dishonoured in the afternoon by a deluge of nasty tobacco-juice. Gentlemen smokers love segars [tobacco rolled up in a particular form] better than carpets. Think, sir, what a woman must endure under such circumstances; and then, after all, to be reproached with her cleanliness, and to have her white-washings, her scourings, and her scrubbings, made the subject of ridicule, it is more than patience can put up with. What I have now exhibited is but a small specimen of the injuries we sustain from the boasted superiority of men. But we will not be laughed out of our cleanliness. A woman would rather be called any thing than a slut, as a man would rather be thought a knave than a fool.

I had a great deal more to say, but I am called away; we are just preparing to white-wash, and of course I have a deal of business on my hands. The white-wash buckets are paraded, the brushes are ready, and my husband is gone off—so much the better: when one is about a thorough cleaning, the first dirty thing to be removed is one's husband. I am called for again. Adieu.

OF THE BULL-FIGHTS IN SPAIN AND PORTUGAL.

THE bull-fights are much in vogue amongst the Spaniards and Portuguese. They consist of a kind of combat of a cavalier against a wild bull, either on foot, or on horseback by riding at him with a lance. The Spaniards have these bull-fights in honour of St. John, the Virgin Mary, &c. This sport the Spaniards received from the Moors, among whom it was celebrated with great eclat. Some think that the Moors received the custom from the Romans, and they from the Greeks; Dr. Plot is of opinion, that the Thesalians first instituted this game, that Julius Cæsar learned it of them and brought it to Rome, and that this was the origin of the Spanish and Portuguese bull-fighting, and of the English bull-running.—The practice was prohibited by Pope Pius V. under pain of excommunication; but succeeding popes granted several mitigations.

From the following account of a bull-feast in the Coliseum at Rome, in 1332, extracted from Muratori by Mr. Gibbon, the reader may form some idea of the pomp, the ceremony, and the danger, which attended these exhibitions. “A general proclamation as far as Rimini and Ravenna invited the nobles to exercise their skill and courage in this perilous adventure. The Roman ladies were marshalled in three squadrons, and seated in three balconies, which on this day, the 3d of September, were lined with scarlet cloth. The fair Jacova de Rovere led the matrons from beyond the Tiber, a pure and native race, who still represent the features and character of antiquity. The remainder of the city was divided between the Colonna and Ursina families: the two factions were proud of the number and beauty of their female bands: the charms of Savella Ursini are mentioned with praise; and the Colonna regretted the absence of the youngest of their house, who had sprained her ankle in the garden of Nero’s tower. The lots of the champions were drawn by an old and respectable citizen; and they descended into the arena, to encounter the wild bulls on foot with a single spear.—Amidst the crowd, our annalist has selected the names, colours, and devices, of twenty of the most conspicuous knights: several of the names are the most illustrious of Rome and the ecclesiastical state; Malatesta, Polenta, Della Valle, Cafarello, Sivelli, Cappoccio, Conti, Annibaldi, Altieri, Corsi. The colours were adapted to their taste and situation; and the devices are expressive of hope or despair, and breathe the spirit of gallantry and arms. “I am alone, like the youngest of the Horatii,” the confidence of an intrepid stranger: “I live disconsolate,” a weeping widower: “I burn under the ashes,” a discreet lover: “I adore Lavinia or Lucretia,” the ambiguous declaration of a recent passion: “My faith is as pure,” the motto of a white livery: “Who is stronger than myself?” of a lion’s hide: “If I am drowned in blood, what a pleasant death!” the wish of ferocious courage. The pride or prudence of the Ursini restrained them from the field, which was occupied by three of their hereditary rivals, whose inscriptions denoted the lofty greatness of the Colonna name: “Though sad, I am strong:” “Strong as I am great:” “If I fall (addressing himself to the spectators), you fall with me:” intimating, (says the writer,) that, while the other families were the subjects of the Vatican, they alone were

were the supporters of the Capitol. The combats of the amphitheatre were dangerous and bloody. Every champion successively encountered a wild bull; and the victory may be ascribed to the quadrupeds, since no more than eleven were left on the field, with the loss of nine wounded and eighteen killed on the side of their adversaries. Some of the noblest families might mourn; but the pomp of the funerals, in the churches of St. John Lateran and St. Maria Maggiore, afforded a second holiday to the people. Doubtless it was not in such conflicts that the blood of the Romans should have been shed; yet, in blaming their rashness, we are compelled to applaud their gallantry; and the noble volunteers, who display their magnificence and risk their lives under the balconies of the fair, excite a more generous sympathy than the thousands of captives and malefactors who were reluctantly dragged to the scene of slaughter."

A striking relic of this pagan festival is observable in the Spanish manners at the present day. Many Spaniards consider this practice as the sure means of preserving that energy by which they are characterised, and of habituating them to violent emotions, which are terrible only to timid minds. But it seems difficult to comprehend what relation there is between bravery and a spectacle where the assistants now run no danger; where the actors prove, by the few accidents which befall them, that their's has nothing in it very interesting; and where the unhappy victims meet only with certain death as the reward of their vigour and courage. Another proof that these spectacles have little or no influence on the disposition of the mind is, that children, old men, and people of all ages, stations, and characters, assist at them; and yet their being accustomed to such bloody entertainments appears neither to correct their timidity, nor alter the mildness of their manners.

These bull-fights are very expensive; but they bring great gain to the undertakers. The worst places cost two or four rials, according as they are in the sun or the shade; the price of the highest is a dollar. When the prices of the horses and bulls, and the wages of the *correadores*, or bull-fighters, have been paid out of this money, the rest is generally appropriated to pious foundations; at Madrid, it forms one of the principal funds of the hospital. It is only during summer that these combats are exhibited, because the season then permits the spectators to sit in the open air, and because the bulls are then more vigorous. Those which are of the best breed are condemned to this kind of sacrifice; and connoisseurs are so well acquainted with their distinguishing marks, that, as soon as a bull appears upon the arena, they can mention the place where he was reared. This arena is a kind of circus surrounded with seats, rising one above another; the highest of which only is covered. The boxes occupy the lower part of the edifice. In some cities, Valladolid for example, which have no place particularly set apart for these combats, the principal square is converted into a theatre. The balconies of the houses are widened, so as to project over the streets which end there; and it is really a very interesting sight to see the different classes of people assembled around this square, waiting for the signal when the entertainment is to commence, and exhibiting every external sign of impatience and joy. The spectacle commences by a kind of procession round the square, in which appear, both on horseback and on foot, the combatants who are to attack
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the fierce animal ; after which two alguazils, dressed in perukes and black robes, advance with great gravity on horseback ; who go and ask from the president of the entertainment an order for it to commence. A signal is immediately given ; and the animal, which was before shut up in a kind of hovel with a door opening into the square, soon makes his appearance. The bull is received with loud shouts, and almost stunned by the noisy expressions of joy. He has to contend first against the picadores, combatants on horseback, who, dressed according to the ancient Spanish manner, and as it were fixed to their saddles, wait for him, each being armed with a long lance. This exercise, which requires strength, courage, and dexterity, is not considered as disgraceful. Formerly the greatest lords did not disdain to practise it ; even at present some of the hidalgos solicit for the honour of fighting the bull on horseback, and they are then previously presented to the people, under the auspices of a patron, who is commonly one of the principal personages at court.

The picadores, whoever they may be, open the scene. It often happens that the bull, without being provoked, darts upon them, and every body entertains a favourable opinion of his courage. If, notwithstanding the sharp-pointed weapon which defends his attack, he returns immediately to the charge, their shouts are redoubled, and their joy is converted into enthusiasm ; but if the bull, struck with terror, appears pacific, and avoids his persecutors, by walking round the square in a timid manner, he is hooted at and hissed, and those near whom he passes load him with blows and reproaches. He seems then to be a common enemy, who has some great crime expiate ; or a victim, in the sacrifice of which all the people are interested. If nothing can awaken his courage, he is judged unworthy of being tormented by men ; the cry of *perros, perros*, brings forth new enemies against him, and large dogs are let loose upon him, which seize him by the neck and ears in a furious manner. The animal then finds the use of those weapons with which nature has furnished him ; he tosses the dogs into the air, who fall down stunned, and sometimes mangled ; they however recover, renew the combat, and generally finish by overcoming their adversary, who thus perishes ignobly. If, on the other hand, he presents himself with a good grace, he runs a longer and nobler, but a much more painful, career. The first act of the tragedy belongs to the combatants on horseback ; this is the most animated and bloody of all the scenes, and often the most disgusting. The irritated animal braves the pointed steel, which makes deep wounds in his neck, attacks with fury the innocent horse who carries his enemy, rips up his sides, and overturns him together with his rider. The latter, then dismounted and disarmed, would be exposed to imminent danger, did not combatants on foot, called *chulos*, come to divert the bull's attention, by shaking before him pieces of cloth of various colours. It is, however, at their own risk that they thus save the dismounted horseman ; for the bull sometimes pursues them, and they have then need for all their agility. They often escape by letting fall in his way the piece of stuff which was their only arms, and against which the deceived animal expends all his fury. Sometimes he does not accept this substitute, and the combatant has no other resource but to throw himself speedily over a barrier, six feet high,

high, which incloses the interior part of the arena. In some places this barrier is double, and the intermediate space forms a kind of circular gallery, behind which the pursued torreadore is in safety. But, when the barrier is single, the bull attempts to jump over it, and often succeeds. The reader may easily imagine in what consternation the nearest of the spectators then are; their haste to get out of the way, and to crowd to the upper benches, becomes often more fatal to them than even the fury of the bull, who, stumbling at every step, on account of the narrowness of the place and the inequality of the ground, thinks rather of his own safety than of revenge, and besides soon falls under the blows which are given him from all quarters.

Except in such cases, which are very rare, he immediately returns. His adversary, recovered, has had time to get up; he immediately remounts his horse, provided the latter is not killed or rendered unfit for service, and the attack re-commences; but he is often obliged to change his horse several times. Expressions cannot then be found to celebrate these acts of prowess, which for several days become the favourite topic of conversation. The horses, very affecting models of patience, courage, and docility, may be seen treading under their feet their own bloody entrails, which drop from their sides half torn open, and yet obeying, for some time after, the hand which conducts them to new encounters. Spectators of delicacy are then filled with disgust, which converts their pleasure into pain. A new act is however preparing, which reconciles them to the entertainment. As soon as it is concluded that the bull has been sufficiently engaged by the combatants on horseback, they retire and leave him to be irritated by those on foot. The latter, who are called *banderilleros*, go before the animal; and the moment he darts upon them they plunge into his neck, two by two, a kind of darts called *banderillas*, the points of which are hooked, and which are ornamented with small streamers made of coloured paper. The fury of the bull is now redoubled; he roars, tosses his head, and the vain efforts which he makes serve only to increase the pain of his wounds; this last scene calls forth all the agility of his adversaries. The spectators at first tremble for them, when they behold them braving so near the horns of this formidable animal; but their hands, well exercised, aim their blows so skilfully, and they avoid the danger so nimbly, that, after having seen them a few times, one neither pities nor admires them, and their address and dexterity seem only to be a small episode of the tragedy, which concludes in the following manner: when the vigour of the bull appears to be almost exhausted; when his blood, issuing from twenty wounds, streams along his neck and moistens his robust sides; and when the people, tired of one object, demand another victim; the president of the entertainment gives the signal of death, which is announced by the sound of trumpets. The matador then advances, and all the rest quit the arena; with one hand he holds a long dagger, and with the other a flag, which he waves backwards and forwards before his adversary. They both stop and gaze at one another; and, while the agility of the matador deceives the impetuosity of the bull, the pleasure of the spectators, which was for some time suspended, is again awakened into life. Sometimes the bull remains motionless, throws up the earth with his foot, and appears as if meditating revenge.

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The bull in this condition, and the matador who calculates his motions and divines his projects, form a group which an able pencil might not disdain to delineate. The assembly in silence behold this dumb scene. The matador at length gives the mortal blow; and, if the animal immediately falls, a thousand voices proclaim with loud shouts the triumph of the conqueror; but if the blow is not decisive, if the bull survives and seeks still to brave the fatal steel, murmurs succeed to applause, and the matador, whose glory was about to be raised to the skies, is considered only as an unskilful butcher. He endeavours to be soon revenged, and to disarm his judges of their severity. His zeal sometimes degenerates into blind fury, and his partizans tremble for the consequences of his imprudence. He at length directs his blow better: the animal vomits up blood; he staggers and falls, while his conqueror is intoxicated with the applauses of the people. Three mules, ornamented with bells and streamers, come to terminate the tragedy. A rope is tied round the bull's horns which have betrayed his valour, and the animal, which but a little before was furious and proud, is dragged ignominiously from the arena which he has honoured, and leaves only the traces of his blood and the remembrance of his exploits, which is soon effaced on the appearance of his successor. On each of the days set apart for these entertainments, six are thus sacrificed in the morning, and twelve in the afternoon, at least in Madrid. The three last are given exclusively to the matador, who, without the assistance of the picadores, exerts his ingenuity to vary the pleasure of the spectators. Sometimes he causes them to be combated by some intrepid stranger, who attacks them mounted on the back of another bull, and sometimes he matches them with a bear: this last method is generally destined for the pleasure of the populace. The points of the bull's horns are concealed by something wrapped round them, which breaks their force. The animal, which in this state is called *embolado*, has power neither to pierce nor to tear his antagonist. The amateurs then descend in great numbers to torment him, each after his own manner, and often expiate this cruel pleasure by violent contusions; but the bull always falls under the stroke of the matador. The few spectators who are not infected by the general madness for this sport, regret that those wretched animals do not, at least, purchase their lives at the expence of so many torments and so many efforts of courage; they would willingly assist them to escape from their persecutors. In the minds of such spectators, disgust succeeds compassion, and satiety succeeds disgust. Such a series of uniform scenes makes that interest become languid, which this spectacle, on its commencement, seemed to promise. But to connoisseurs, who have thoroughly studied all the stratagems of the bull, the resources of his address and fury, and the different methods of irritating, tormenting, and deceiving, him, none of these scenes resembles another, and they pity those frivolous observers who cannot remark all their varieties. Even the court formerly reckoned bull-fights among the number of its festivals. The Plaza Mayor was the theatre of them, and the king and the royal family honoured them with their presence. His guards presided there under arms. His halberdiers formed the interior circle of the scene; and their long weapons, held out in a defensive posture, were the only barriers they opposed against the dangerous caprices of the bull:

bull : and these entertainments were called, by way of excellence, *fiestas reales*, or 'royal feasts.' M. Florin, in his *Conquest of Granada*, published at Paris in 1791, has the following very elegant description of a *bull-fight*, as given by Isabella, the Spanish queen, to exhilarate the drooping courage of her troops, during the important siege of that city :

"In the center of the camp is a vast circus surrounded with rows of seats rising one above the other ; thither the Castilian queen, queen, skilled in the happy art of gaining the hearts of her subjects by providing pleasures for them, often invited her warriors to the favourite amusement of the Spaniards. There the youthful chiefs, laying aside their coats of mail, and clad in silken vests, armed only with lances, and mounted on the fleetest couriers, attack and vanquish the most savage bulls. The soldiers on foot, still more lightly armed, with their hair bound up in nets, hold in one hand a purple veil, and, in the other, sharp lances. The alcade proclaims the laws of the fight, that no combatant shall be assisted, and that they shall be allowed no other arms than the lance for the attack, and the purple veil for defence. The monarchs, surrounded by their court, preside at these sanguinary amusements ; and the whole army, seated in the vast amphitheatre, testify, by loud shouts of joy and the most violent expressions of applause, their excessive fondness for these ancient combats. The signal is given, the barrier opens, the bull rushes into the midst of the circus ; but, on seeing the spectators, on hearing their shouts, accompanied with the sound of thousands of trumpets, he stops astonished and dismayed ; his nostrils smoke ; with glowing eyes he looks around the amphitheatre : he seems suspended between amazement and fury. He suddenly attacks a knight, who wounds him and gallops at full speed to the other end of the circus : the bull, enraged, closely pursues, tears up the ground with fury, and rushes on the splendid veil, which one of the foot-soldiers holds out before him. The agile Spaniard in one instant eludes his force, suspends the light veil on his horns, and launches a sharp dart, which makes him bleed anew. Soon after, pierced by all their lances, and by the penetrating darts, the barbed points of which remain in the wound, the animal bounds over the plain, utters the most dreadful bellowings, runs furiously round the circus, shakes the innumerable darts that stand thick in his broad neck, scatters around him a cloud of sand and pebbles mixed with shreds of purple stained with blood and foam, till at length he falls exhausted by violence, rage, and anguish. In one of these combats, the rash Cortez narrowly escaped losing a life destined to great exploits. Ardent to signalize himself before the beautiful Mendoza, who had long possessed his heart, Cortez, mounted on an Andalusian steed, wounded a furious bull, and fled. Notwithstanding the danger that threatened him, the young lover keeps his eyes fixed on the beauty that ever engrossed his thoughts, and sees an orange blossom, that had adorned her bosom, fall into the arena. Cortez springs from his courser, runs and stoops to pick it up ; the bull rushes onward, and aims at the imprudent youth. Mendoza cries warn him of his danger. Cortez, without letting go the flower, directs his lance with a steady eye at the shoulder of the animal, who instantly falls dead on the sand. The soldiers all join in shouts of applause : Isabella offers to crown him as a victor : but Cortez declines

clines the wreath, and shews the valued flower, which had nearly cost him his life. He bestows innumerable kisses on it, presses it to his heart, breaks his lance, and leaves the circus."

Pepin king of France, surnamed, from his diminutive size, *le Bref*, or 'the Short,' introduced a combat of this description at Paris, with a view to convince his subjects, that, notwithstanding his deficiency of stature, he was not deficient in strength and magnanimity, and consequently not unworthy to reign over them.—In this entertainment, which included a fight between a bull and a lion, the latter had got his antagonist under; when Pepin, turning towards his nobility, said, "Which of you will dare to go and part or kill these furious beasts?" The bare proposal made them thudder: nobody made answer. "Then I will be the man," replied the monarch; upon which, drawing his sabre, he leaped down into the arena, made up to the lion, and killed him; and, without delay, discharged such a stroke on the bull as left his head hanging by the upper part of his neck. The courtiers were equally amazed at such courage and strength; and the king, with an heroic loftiness, said to them, "David was a little man; yet he laid low the insolent giant who had dared to despise him."

The feudal custom called *bull-running*, which appears to have had its origin from bull-fights, was for many ages in use at Tutbury in Staffordshire; where, anciently, on the day of the assumption of our Lady, a bull was turned loose by the lord to the minstrels; who, if they could catch and conquer him before he passed the river Dove, were to have him for their own, or, in lieu thereof, to receive each forty-pence; in consideration of which custom, they paid twenty-pence yearly to the lord.

BIRTH OF THE PLEASING ARTS.—*An Arcadian Romance.*

IN a valley of Arcadia, Amaryllis was a shepherdess; on the rocks above, Lycidas was a goatherd. Their situation approached that of primæval solitude; never had they observed other human forms than their old fathers and mothers, whom they visited at the full moon, when their flocks were guarded by the silence of sleep.

In the luxuriant valley Amaryllis conducted her sheep, while Lycidas pursued his capricious goats on the rocky cliffs. Amaryllis found her companions like herself, timid and docile; they rather followed her, than the them. Often had she measured her height with the old ewes, and discovered how she increased in stature.

Lycidas was vigorous as the goats he chased; he flew fearlessly along the points of cliffs, and stood on one foot, at the edge of a precipice, to snatch the wild goat hanging at the perilous extremity. Amaryllis frequently observed him above her with a tremulous delight; and, imitating his voice, found that her tones could not, like his, fill the hollow hills. Ah! there, she thought, is one like myself, whose strong feet outleap a goat! Lycidas looked down sometimes on Amaryllis, and thought, There is one like myself, whose soft look is more tender than the eye of a lamb!

One day the shepherdess, at the brink of a river, was bathing a lamb; while Lycidas, leaning from a rock above, watched the transparent water-drops trickling on its snowy coat, and hanging her fingers with pearls. The lamb fell into the river; Amaryllis

shrieked. Behold Lycidas in the stream! He brings the breathless animal; he dries its velvet skin; he warms it in his breast; its little sides palpitate once more. It is born again! (he exclaims,) presenting it to Amaryllis.—Ah! (said the pastoral virgin, looking her gratitude,) I thought, till now, that a goatherd cared not for the sorrows of a shepherdess.—Oh, Amaryllis! (replied Lycidas,) I often think of thee.—How singular is this, oh Lycidas! I, too, often think of thee.—When I view thee kissing a lamb, I would give ten of my goats to be that lamb.—Lycidas, thou shalt have my kisses when thou wilt; come from the mountains when thou wouldst have me kiss thee!

After this interview, Lycidas was continually descending from the rocks to receive the caresses of Amaryllis. But sweet kisses inspired sweet words: it became necessary to unite the goats of Lycidas with the sheep of Amaryllis; and the mountaineers gradually abated their wildness among the mild inmates of the valley: yet, though influenced by the local softness, and losing their restless desire of climbing by continually treading on a level earth, they still retained their untamed spirit; and, never mingling with the timorous, ever preceded and conducted the feeble domestic.

Observe, (said Amaryllis to Lycidas,) how thy goats disdain the society of my sheep! How is it, oh Lycidas! that thou admittest me to thy arms, as if I were thy equal?

I have heard my father say, (replied the youth,) that man is an animal more noble than a goat; that his face looks up towards the gods. And yet this seems an error; for my face only looks straight forwards; were I to look up to the gods, I should stumble.

Couldst thou ever understand, (enquired Amaryllis,) what the goats think of man?—Oh, yes! assuredly they deem themselves superior. They climb, with their hollow foot, on ridges narrow as thy slender finger. I have viewed them sleep on the point of a precipice, where my eye only could touch them: I have waked them by my voice; but they only raised their heads and shook their beards, and again laid themselves to sleep. I have watched at the foot of the rock, in patient helplessness. Such is man!

I have often thought, (replied Amaryllis,) that a man is a kind of goat; for our fathers have beards, but the faces of our mothers are smooth as mine and my sheep. Thou too wilt have a beard, no doubt, (she passed her hand playfully over his chin;) already I perceive a fine brown shade glisten around thy face. How soft! I touch it, but cannot feel it. Be sure all human beings are only a kind of goats and sheep. Thine eye seems to command nature, thy strong step echoes on the earth; but I timidly follow thee, and all my glory is my submission.

In conversations thus simple and innocent, they sometimes interchanged their thoughts; but they sported more than they talked. At the margin of a lucid fountain, or under an umbrage dropping roses, they divided their milk and their fruits; the velvet turf sprang under their flying feet; the echo multiplied their silver voices. Mimicking a butting goat, Lycidas would run at Amaryllis; but Amaryllis most loved to lie down like a sheep, and, in short pantings, breathe on her beloved Lycidas. Amaryllis would conceal herself behind a woodbine hedge, or lie in the covering fern; and then Lycidas would call on her, seek her through all her hiding spots, and murmur at, yet half enjoy, the feigned absence. Seldom could

could he track her through her inventive and mysterious paths, till the playful maid betrayed herself by a loud laugh; or attempted to fly, while her inviting eyes accused the pursuer's tardy embrace. Sometimes when he returned home she would lie down, feigning to sleep, while her eyes were half open, to see if Lycidas would immediately hasten to her; the youth kneeled, and sighed, and kissed her eyes, till she laughed. Sometimes he would disorder her wavy tresses, while she murmured with a smile; and then would adorn them to his fancy, studding them with roses, or braiding them with jessamine. But, if he often loved to disorder her fine tresses, he was careful, in passing her favourite flowers, to support their bended stalks, and to weave more closely her favourite shades. The tender reminiscence of her lover's attention often mingled with the delicious perfumes of the flower, and the bowery verdure of the tree. He would compose what he called serpents of flowers, and fancifully wind them about her long tresses, praying the gods that no other serpents might ever approach her.

One evening, beneath a lofty myrtle-tree, the beauteous Amaryllis was lamenting the death of a nightingale. She said, Sweetest tears have fallen with the touching close of its delicious tones: I felt the music creep along my nerves, and the fine vibrations play through my heart. I weep now, Lycidas, when I think such a charming sadness may never again give delightful tears.

Ah! that I could recal thy nightingale into existence, as I did thy drowned lamb! exclaimed the amiable youth.—Thou never canst, dear companion! it breathed a long and dying fall, like the gentle airs, moving the tops of the hollow reeds, making a moaning melody.—Studious to charm his beloved with the voice of the nightingale, the thoughts of Lycidas produced a restless night: the next day he gave Amaryllis the care of his goats, and promised an early return. The sun declined, and Lycidas returned not. Amaryllis sighed at its farewell beam. She sat, her head reclining on her arm. Suddenly aerial notes floated in soft remote sounds. The startled Amaryllis exclaimed, The air sings in the clouds! The notes seemed approaching to her. She looked up at the myrtle-tree. They warbled more musically clear. She perceived Lycidas: he held something in his hands to his lips.—Hast thou found another nightingale? (Lycidas replied but by the accents of his harmonious mouth.) What miracle is this! Canst thou give a vocal soul to a hollow reed?—Yes, (replied Lycidas,) it was thou who didst instruct me: thou didst resemble the voice of the nightingale to the light airs breathing on the hollow reeds. All day I wandered for a nightingale, and I found none: I took a reed, and made little entrances for my breath: I said, Oh, gentle reed! I can give thee air, if thou canst yield me the voice of the nightingale: I breathed, and it was MUSIC.

This first of flutes was their most valued acquisition, for it bestowed a new pleasure; and, in the solitude of lovers, pleasure is their only avarice. Lycidas, gradually modulating his reed by his ear, perceived the successive sounds of melody, and, at length, the concords of harmony; but often, weary with trying musical sounds, the eyes of Amaryllis fired his soul, and the rapt enthusiast, tender or gay at such moments, made his lively inflections, and variety of accent, imitate their sensations and echo their passions. Such was the progress

gress of instrumental music.—As they wept or laughed, they marvelled how the air, through a hollow reed, could speak more persuasively to their hearts, than their own voices; they knew not that the imitations of art please more than nature herself. When Lycidas played, Amaryllis could not sit still, and her gestures corresponded with the passions he inspired. Was Amaryllis capricious? Lycidas breathed a long dissolving strain; sounds associated in her mind with ideas of tenderness; her ear arrested her steps, and silenced her tongue; while the sweetness of her physiognomy melted in the dew of her eye, and expressed itself in many a passionate attitude. Was Amaryllis plunged in the softest melancholy? Aerial tones, rapid and voluble, vibrated around; till, stealing the sense of thought from the pensive beauty, they broke into gay melodies; while, responsive to their cheerful influence, her light footsteps gave what Lycidas termed the music to the eye: and such was the origin of theatric DANCE.

Their enjoyments were only interrupted by his frequent absences: whole days were sometimes passed in search of a wanton goat. How terrible is the absence of him in whose presence alone the heart feels the sense of existence! She thought this, one night in a cave where Lycidas was sleeping, while the wakeful beauty hung enamoured over each interesting feature: a suspended lamp was placed near.—Ah! (she continued) even this pleasing light, this soft moon of my chamber, is the thought of his genius. It was from the pendent light of the glow-worm, in the illumined hedge, that he stole the hint; it is thus that, borrowing every happy conception from nature, he discovers around him the sources of enjoyment.

The lamp threw its light on the even wall, and the solitary flame strongly reflected the shadow of his face.—Ye gods! (exclaimed the fond maid,) behold two Lycidases! Ye speaking features, can ye not for ever dwell on that walk? then would Lycidas not entirely quit me in his absence. How consoling even the shadow of what we love! Lycidas! thy shade would to me prove a tender companion. Fugitive and cherished shadow! live here when Lycidas roves in the circling mountains!

She took up her sheep-hook, and affectionately tracing the shadow of her lover, its sharp iron graved it on the wall. Lycidas turned, and the lines remained unmoved.—He is for ever there! (exclaimed the enraptured Amaryllis.) Lycidas awoke.—Who is here? Amaryllis!—Thyself, thyself! (she cried, in embracing him.) These eyes shall worship thee when thou art on the cliffs: whole suns from me, the light shall give me thy presence in the mimic wonder. Behold thy half-closed eye, thy half-opened lips, for ever smiling on that wall! Lycidas looked on the wall and on Amaryllis, and they embraced. Such was the origin of DESIGN.

Amaryllis, in the absence of Lycidas, passed many hours in contemplating this first portrait of love. But the familiarity of enjoyment discovered its imperfections.—Dismal shadow! (she cried,) thou pleasest me, because thou resemblest Lycidas; but Lycidas would not charm me, did he resemble thee! Where is the soft mutability of his cheek? Melancholy resemblance of a form of gaiety! Only when Lycidas is dead, will he resemble thee!

She held in her lap a treasury of flowers, which she was assorting to weave into a wreath for Lycidas. She took a rose, and continued:—

nued :—This breathing rose is the hue of his cheek : O shade ! I will place it on thy cheek ! This white lily is like the snow of his forehead : that its splendid whiteness could for ever spread on thine ! These blue violets are the purple of his veins : and she delicately laid them along the neck. And this dark eye of the tulip is black as his brilliant eye : and she fixed it there !

Entranced, she gazed on the illusive shadow : for a moment it was her Lycidas ! his beautiful colours lived to her eye. Such was the first essay of colouring ! The tinted impressions which some of the flowers left behind, gave them afterwards a hint to express, from various plants and minerals, that variety of colours which gave birth to the more perfect parts of PAINTING !

Seated, in the sultry silence of summer, at the entrance of a grove, they viewed their flocks retired beneath the umbrageous hedges.—Dear Lycidas, (said the smiling maid,) how amiable the dewy mornings and the clear noons of summer ! I love at noon-tide to lay myself beside some rippling water, and listen to its cooling murmurs mingling with the airy murmurs of a bee : oft as they blend, they lull my spirits with one rocking sound, and I catch some half-dream. It is in winter I feel unhappy : the cave our fathers hewed is so round, or so square, one sees the termination of every thing ; nothing is left to the imagination. It is not thus in nature ; she never imprisons the eye ; all her lines are waved, and varied, and enchanted. How often I sigh when I view nothing of life and motion before me, but the solitary flame trembling on the opposite wall !

Lycidas replied :—Had I been idle last winter, as thou wert, I too should have been melancholy in the cave. Then I made reeds for summer songs, I added another aperture to my flutes, and I produced a new music. How many hast thou broken in thy first lessons ? Do not mind them, Amaryllis ; I am pleased when thou breakest them ; for to me it is delightful to amend thy reeds, and to pass my fingers over the places thine have touched.

She kissed Lycidas, and said :—Oh, that our days may be blended, as the air we played this morning ; two symphonious instruments yielding but one modulation. The other evening, waiting thy return beside the rivulet, I thought it were happiness for us to resemble it ; when it receives a new stream, the two streams can never be separated ; they touch, and are for ever united !

And I wish, (continued Amaryllis,) that we could live in such a grove through the happy circle of the year.—Thou dost nothing but wish, (said Lycidas.)—Had I such a grove in winter, the aspect of nature would console me in thy absence. Observe how finely arched is the grove above us by the interwoven boughs ; as if placed in a regular order, view the straight trunks of the palm-trees ; mark the little openings around, delighting the eye with various views ; and here, as we sit, this seems the only entrance of the grove. On the hollow curves of these trees my foot has rested, when I climbed, till I was seated at their summit. One day I ascended, and descried thee on the great rock, directing thy goats. I saw thee urging the vagrants home, and often kissing thy hand as thou didst stretch it towards our valley ; approaching, thou didst sound thy reed ; then my heart bounded with the tender thought, that thou didst remember me when thou thoughtest that I could not see thee !

While the voluble beauty was describing the grove, the eye of
Lycidas

Lycidas had intensely followed the objects of her fancy. And now he was lost in reverie. The bunch of grapes he held in his hand remained unplucked; when she ceased, he spoke not; he wandered from thought to thought; he sat in motionless abstraction.

Art thou disordered, my sweet Lycidas? Not one smile dimples thy cheek; the heaviness of sleep presses thy lids. Ah! thou lookest on the earth, and not on Amaryllis!

Lycidas, starting from his trance, flung the grapes from his hand in rapture. The creative smile of enthusiasm lighted up every feature; his eye swam in a liquid fire; a tremor of sensibility vibrated through his frame. Looking on Amaryllis with complacency, he said—I was only thinking.

And why dost thou think, dear Lycidas? to think is to toil. With thee I never think, I only feel; it is in thine absence I think and suffer. In the enjoyment of thy presence, when I lay my hand on thy beating heart; when I feel my trembling lips on thy soft lips; when I blend my breath with thy breath; it is then I am all sensation. Ah! then should a single thought intervene, I should feel it an interruption of my existence.

Lycidas replied, smiling, Dost thou not perceive that thou thyself art thinking, while thou prattlest against the labour of thought?

To think with thee, Lycidas, seems no pain; my thoughts embrace thy thoughts, as my arms wind around thy arms. In thine absence only thinking tortures; for, since I have known thee, I abhor all that is solitary.

After this conversation, Lycidas was constantly absent from Amaryllis. He had ever some prompt excuse. A goat was missing; he counted the herd, and the number was just. He fell down the rock, and was lamed; he examined his foot, and it was unmarked by a bruise. He was in pursuit of a nightingale, but he never brought one home. He had listened hours near a bed of reeds, that his ear might discover a new music; but he still could only play on one kind of reed. The autumn was closing, and his excuses of absence became every day more unsatisfactory.

Amaryllis sat deserted, and her whole soul dreamed of Lycidas. Her melancholy diffused itself over every surrounding object. How nature has suddenly changed! exclaimed the solitary virgin. She murmured with the murmurs of the rivulet; she sighed with the evening zephyr; she flew to the portrait, and on the face of the shadowy Lycidas rolled living tears.

The evening return of Lycidas came unmarked by fondness; penfive, weary, and silent; a cold caress, a rapid meal, and a deep slumber. It was now that she first perceived how, in the presence of unsocial man, one may find a terrible solitude.

Sometimes she thought of tracking his concealed retreat; yet it was long ere she could persuade herself to abandon, for one day, the flock and the herd. Once she followed him; in agony she pressed his rapid footsteps on the morning dews; she came to a high rock from whence Lycidas precipitated himself with ease to another and disappeared! She returned to the valley to think and to mourn.

At length the habitual reverie of melancholy thought and desponding curiosity presented a monstrous imagination to her disordered senses; the terrific chimera that breeds in the delirium of love. She struck her lovely forehead; the pulses of her temples
rose,

rose, burning, to her touch; her soul sickened, her frame shivered. She felt the pang of jealousy!

She thinks Lycidas may have discovered another Amaryllis: he flies to kiss other cheeks! There are, doubtless, beings like ourselves on this earth: other vallies, other rocks, and other shepherdesses! Ah! if every valley should have its Amaryllis, then is Lycidas for every lost to me; for all will adore Lycidas, though Lycidas may adore none. Ah, ingrate! capricious as thy goats! were there as many Lycidases, thou wouldst be to me the only Lycidas; for I feel I have but one heart, and one heart can love but once.

Every evening Lycidas found his Amaryllis in tears. He said, Why dost thou weep?—Lycidas, canst thou ask why I weep? When thou shakest the flower, dost thou inquire why the trembling dewdrops are scattered?

Lovelier than the flowers at thy seat in the grove, has thy Lycidas ever rudely touched thy softness?

Lycidas, those flowers thy hands reared are faded. Once, in gazing on them, methought they had a voice; I heard, or seemed to hear, thou wert then kissing another Amaryllis. I turned, in horror, from those flowers. How one can cherish and abhor the same object!

Another Amaryllis! (exclaimed Lycidas.) Is there another on this earth? I have seen the same plants, and the same animals, reproduce themselves; but never have I seen an infant Amaryllis. I consider thee as a solitary beauty in Nature; there is but one sun, one moon, and one Amaryllis!

Enamouring embraces gave to the virgin's soul a new sensation of felicity; that which, in one day, restores the lost happiness of years. Drops of tears rolled on the fine carnation of her cheek.—Still thou weepest! cried Lycidas, kissing them one by one.—Lycidas, these are not like the tears I wept.—Are there, then, two kinds of tears?—What know I, but this, oh, Lycidas! that I could wish for ever to feel the strange delight of these sweet tears.

When Lycidas awoke the succeeding morning, he quitted not Amaryllis as of late. An unanxious sleep restored the serenity of pleasure; his soul moved in the calm of the passions; his eye and his hand alike caressed; and his voice had the melody of rapture, for he anticipated a new enjoyment.

He spoke.—Feelest thou not the hoary morning with its frosty breath? soon will it come with a naked head spread with ungenial snow: the old year creeps on with the imperfect day. Is not the old year like our old fathers? Thou must quit thy grove.—Alas! if thou forsakest me this winter, the cave will be my sepulchre. Thou must bury me in it, as we buried the father of my father.

Amaryllis! thou shalt no more live in a cave; thou shalt reside in a grove; but it is a grove without leaves. It was for this I quitted thee incessantly. I toiled, till my limbs could scarcely conduct me home; I thought, till even in thy presence my thoughts felt weary.—A smile played on the pensive features of Amaryllis; an indistinct idea rushed across her mind.—Say, what novel miracle has Lycidas invented?—Come with me! cried the youth, rising with rapture.—I cannot (said Amaryllis): I once followed thee till I reached the great rock, from whence thou flewest like the eagle that builds its nest there.—For thee a smoother passage is formed: thou shalt

walk over the waters!—What sayest thou! Can the foot repeat its steps on aught but the solid earth?—Lycidas returned to his seat, and said: I must first inform thee of another discovery. One day, returning to the grove without leaves, I found the rock had departed. I sought to enter by the lower part; the broad stream opposed. I swam across; but thou canst not swim!—Alas! exclaimed Amaryllis, —I sat dejected on the bank. As my eye reached the grove without leaves, I sighed. A long-tailed bird now flew across the stream. It floated in air by the undulations of its tail. Till then I had never observed the manner of its flight: but we find every thing, when we are deeply interested in its discovery; and Nature—

Proceed, proceed! (cried the impatient Amaryllis;) thou art too fond of reflections.

I then perceived a large fish. I observed the sharp fins cutting the wave; its head steadily firm; its tail moving gently from side to side. Suddenly I cried out, I will make a fish! I took planks; I hollowed the trunk of a tree to bear us within, as if we were the entrails of the fish. I constructed the head (the prow), and the tail (a stern with a moveable helm,) and I made two fins (the oars); but then I found I could not direct the motion against the winds; yet the bird steered against the winds. I placed two pieces of my vest erect in the fish of wood; and these were the wings (sails). And now, Amaryllis, we can swim like a fish, and fly like a bird. The river wanders but for thee; and thou shalt walk on the surface of the waters!

Lycidas now conducted Amaryllis to the banks of the river. She raised her hands in wonder at the view of the wooden fish. Tremblingly she entered. Lycidas unfurled the sail; he pushed off the little bark; and now they glide on the stream!

Be it thine, dear partner of my inventions! (said the first navigator) to conduct the tail of the fish. How proudly it elevates its head! I will give motion to the fins.—In mute astonishment Amaryllis turned the helm. She looked around, and then exclaimed, Lycidas! lo, the mountains and the valleys move! the earth itself wondering at thy happy audacity, rises to pursue us, fugitives from our native soil!

Thou ever yieldest to thy fancy, Amaryllis! The earth moves not, but we move.—Ah, Lycidas! if, in returning to our cherished home, I find all departed from us! where shall I look for our sheep and our goats, if the mountains can leap into the river? Art thou certain the earth moves not? Surely what mimics motion so well, has motion!

Like thee I thought, Amaryllis, when I first quitted the shore: like thee, astonished, I beheld the mountains tremble, and the valleys glide! My heart coiled within me. Impatiently I gained the shore; I grasped it in eager joy; I kissed it, I wept over it: Cherished earth! (I cried,) on which my Amaryllis treads, never shall my feet again wander. But soon I found it had never moved.

Amaryllis now, watching the motion of the oars, was again rapt in wonder. The light water-drops, falling from the raised oars, excited her first attention. She desired to examine them.—I thought (the said) thy fins had white feathers; they glittered like the loose plumage of the dove, scattered by the winds.—How thou fanciest all thou viewest! they are but the shining drops of water falling in

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the sunbeam, and glittering as they fall.—And now she wondered at the oars in the water. Leaning on one side, the little bark overfet, and the two first navigators fell into the stream. Lycidas with one arm embraces the fainting Amaryllis, and with the other steers along the waves; he sustains her drooping head; and toiling in the river, exhausted, gains the opposite bank. The touch of the solid earth restores him; he stretches the recovering beauty on the velvet turf; he awakens life by the warmth of his kisses; and, when her relumed eyes open, the first object they rested on were the eyes of Lycidas. His tender embraces quell her fugitive terrors. The boat floated slowly towards them.

See, Amaryllis! the wooden fish follows us: it was thy error in trusting all thy weight on one side: did I not tell thee we were as the entrails of the fish? I viewed thy deep attention; thou didst look so beautiful with the fullness and softness of thine eyes, that, in gazing on thee, I forgot the danger.

Lycidas, well might I gaze; I viewed another wonder in the stream. The two fins which thou didst lift in the air were straight, but, moving in the water, they were bent and doubled.

Thou errest, Amaryllis; behold them!—He plunged them into the stream; and the oar, strait in the air, was bent in the water. He drew them out and examined them; then looked on the oars, and then on Amaryllis. Her eye was full of fearful wonder.—These are things, said Lycidas, recovering from his alarm, which the gods only understand.

Amaryllis, by the tender solicitude of Lycidas, had received no other ill than the fright of the sudden plunge into the stream. He wrung the water from her fine tresses, he kissed the drops hanging on her lids, and shook the wet from their dress. The sun darted along an azure heaven; they gave no thought to the past, but proceeded pursuing each other in sport.

They reached a deep and luxuriant valley; embosomed among the circling hills, it seemed, even in Arcadia, as if Nature had sought to conceal the spot she fondly embellished. In the centre, another miracle arrested the rapid steps of Amaryllis; she felt the same sensation the polished European even now feels at the view of a pyramid. It was indeed but a rude edifice. The first house! the origin of ARCHITECTURE!

They entered. Amaryllis walked around, ascended, returned, and re-ascended. She spoke only with the interjections of surprise and admiration. Lycidas explained the scene.—What thou viewest, Amaryllis, is for thy winter residence. The cavern confined the fancy of thine eye; I therefore raised this abode on the bosom of the earth itself, that thus thou mayest question Nature from hour to hour, and face to face. Thy conversation in the grove inspired the invention. This abode is but a grove despoiled of its foliage. Behold the straight trunks of the palm-trees (the pillars)! view the vaulted arch the grove formed with its intermingled boughs (the roof, or ceiling). I have hewed the resting places thy foot found on the trunks of trees, and the apertures around, which solaced thine eye (the stairs and windows). Thou didst observe the grove had but one proper entrance, behold it! thou canst find no admittance but between these open piles (the door). And all this I call a grove without leaves. This is but the first rude pile my hands have

reared, like the first shade thou didst trace of my features: when thou didst discover the colouring, thou wert sensible of the imperfection. I foretel new improvements; sublime ideas inflame my soul; and this imitation of Nature shall still be enriched by ornaments, which shall endear this rude edifice, and make it, the house of the heart!

That day they delightfully wandered in this first house. Returning to the boat, Amaryllis promised to give no other motion to the fish of wood, than the quiet action of the tail, or rudder. While she grasped it in her slender hand, she kept her eyes on the full-orbed moon, and sometimes stole a trembling glance on Lycidas. Smiling, he said, Amaryllis, thou mayest move thine eyes; and, if thou smilest on me, the oars will play more freely.—May I move my eyes, Lycidas? Ah! how sweetly is thy face silvered over by the moon! how its beams break along the glittering waves! When the surface of the waters is but lightly touched, the moon looks as if it were swimming through the river; when unruffled, its silvery body seems to sleep along its liquid bed. How musically soft the found of thy cadenced oars dropping in the stream! How wondrous and how sweet is all! Oh, Lycidas! till now I never found a path in the stream; surely the silence on the waters is more awful than the silence on the earth!

Returned to their valley, they found they had been missed. The bleating sheep, from all parts, uttered their small voices of complaint. It was the first day their tender pastorefs had deserted. To want her affection, was to them to suffer a revolution in nature. Some had straggled to the borders of the valley, and trembled in the foreign path; some lay panting, and extenuate; while some sat alone, desolated, knowing not where to go, since now there was no one to follow. Not thus with the goats; they fiercely butted at each other; now ran in circles, now wildly wandered up their native rocks; every where the spirit of revolt prevailed, exulting in a dangerous liberty.

That night, and the succeeding day, Lycidas consumed in the chace of his rebels; and Amaryllis, in a thousand tender offices to her soft-hearted family. This was the first trouble their happy occupations had known, and they reflected.

In seeking for new arts, dear Lycidas, we neglect those of daily use.—Ah! (replied the inventive goatherd, with the ardency of genius,) I wish I had not the care of goats! Soft Indolence, thou nurse of thought! thou shouldst be my choice: stretched in some waving shade, or by some genial blaze, I would meditate on Nature; I would arrange the thousand pictures she has painted on my brain, till from them I stole a thousand hints to form a thousand arts!

My dear Lycidas, much I fear that thy thinking will to thee prove a source of great trouble: the fever of Curiosity scorches thy heart, and thy cheeks lose their vermil fulness. I remember, when I pressed my finger on thy cheek, how it sunk in the firm flesh. No more thou dost taste our simple happiness; no more thou sportest on the fern heath. Often thou stealest to solitude, and often my kisses awakens thee from a day-dream.

They were now desirous of residing in the house. Amaryllis, in quitting the cavern, lamented that she left behind her favourite objects, the portrait of Lycidas, and some beautiful plants which grew

at the entrance of the grove.—Care not for my shadow (cried Lycidas to the sorrowing maid), thou canst trace another on the wall of the house; thou knowest my shadow always accompanies me.—True! but here thou smilest so enchantingly; every feature so felicitously plays in thy intendering physiognomy. Surely when I drew thee thus asleep, thou wert dreaming one of the dreams of genius; the invention of a new art seems painted on thy face.

In vain Lycidas assured her his features would remain the same in all places: to convince her, he laid himself down beside the wall, but essayed in vain to express the same physiognomy. Amaryllis still mourned to leave the shadow of her lover.

This portrait of Lycidas, by having been incessantly traced by the sharp hook of the passionate shepherdes, had gradually become an *alto relievo*; it stood prominent on the wall. At that moment Lycidas was employed in forming clay to fill up cavities in the boat; half vexed that Amaryllis consumed the hour in idle regrets, he violently struck the ductile earth, in sportive anger, against the protuberant image. Behold another miracle! The argillaceous matter received the full impression, and faithfully preserved the physiognomy and the attitude. Thou hast it now! (exclaimed Lycidas.) Now will my shadow wander with thee wherever thou rovest! And this was the first effort of SCULPTURE!

Behold another art! (cried Amaryllis.) Now I feel but one regret—to abandon the cherished plants that live where the grove opens.—Beautiful inspirer of my inventions! in vain my talent toils to reach thy fancy. Thou meritest that I should bid the flowers start into birth beneath thy foot, colouring thy steps. But man cannot create, he can only imitate.

The first house was the source of their winter's happiness. It formed the incessant object of Lycidas's meditation; it absorbed his faculties; it was the passion of his imagination. Every day some new want prompted the invention of some new tool, and at length he discovered marble. Gradual embellishments became visible; and the new ornaments, which had been insensibly formed, one day struck, with their united graces, the thoughtful eye of Amaryllis. It had ceased to be the same house, it might have been called a Palace.

Lycidas (said Amaryllis), I have marked thy constant occupations, and I would not disturb thy happy labours by my complaints. The invention of new arts costs me the loss of many kisses; but my soul, nourishing a spark of thy divine flame, knows how to suffer thy absence even when thou art present. What a scene of enchantment has arisen? Pillars of wood are changed to columns of marble; the foot, that sunk in the damp turf, now glides on the smooth pavement: here, elegant beauty rises in a slender form; there, a massy grandeur reposes, looking its immovability; a certain disposition arranging all, repeating on one side what charms on the other, yet, blending all the parts into one, an uniform variety! But how shall I name that secret something diffused through the whole; the soul animating this edifice like the light, which, itself imperceivable, makes all things perceived? When our language yields not the fullness of expression, we call one thing by another; and this something diffused throughout this edifice, is like music, a silent music; it is harmonious to the eye. My sensations obscure themselves in language; tell me, what is this thou hast raised with the mysterious magic

magic of thy hand?—It is a new art! (replied Lycidas.) The forms thou viewest around I found in Nature; I discovered them in our own forms; and this art is a memorial of human affection!

Explain thyself! said Amaryllis, with fondness and curiosity.—Observe that column opposite. It is delicacy and lightness! It is thyself!—Lycidas smiled, while the wondering Amaryllis leant over him, contemplating the column with the tremor of delight.

Yes, it is thyself! Raised to thy memory, I gave it the delicacy of the feminine character. It has all thy gracility; it is a model of a woman with her ornaments. The volutes at its head, twining in spiral lines, represent thy locks curling beneath thine ear: the deep indented flutings that run down the trunk, imitate the folds of thy flowing dress: the base, which winds like twisted cords, resembles thy sandals.—But the columns opposite are richer than mine. What means that beautiful ornament, which looks like a rich foliage, branching from the top?—It is designed for what it seems. One day, near the cave, thou didst leave a panier on a young acanthus; the panier was covered by a tile, and the rich foliage of the plant grew around it; and we admired how thy basket, covered by a tile, had, as it were, become a part of the acanthus itself, forming a new and beautiful object. Examine it; it is but a copy.

Wonderful, Lycidas! but thyself, where art thou!—There (replied the first architect, pointing to a pillar of the Doric order, which is formed with the proportions and strength of the body of a man; a naked simplicity rather than a finished elegance), mark that plain unadorned column; it was the first I raised; it has a rude and primitive simplicity, for one never knows how to ornament a first production. The origin of the first column was the trunk of a tree; my great difficulty, at first, was to know how high I should make it; the height of the tree was too great, so I proportioned it to my own height. Those long arcades were imagined from a row of trees; and this dome above us, but imitates the vault of heaven.

Divine artist! thou has not explained that secret something, that silent music, which so touches and so satisfies the soul!—What thou fancifully callest a silent music, is the effect of a symmetrical proportion. In art, no inharmonious object is agreeable; all must be balanced. The height must be proportioned to the breadth; the relative parts of a work are measured by the whole, and the whole must be consonant to the parts. Such, Amaryllis, are the concords even in marble! This I learnt from Nature, for it is exhibited in the human form; there we trace an affinity between the foot, the hand, the finger, and all its parts: in every perfect work each individual member should enable us to judge of the magnitude of the work itself. It is thy tapering arms, winding like tendrils round my neck; thy two soul-dissolving eyes; and the regular graces of thy well-proportioned form, that enchant. From Nature and from thee, I learnt the gradual charm of unity in proportion, and uniformity in variety. Such was the origin of the orders of architecture!

It was now spring; the earth was mantled by a verdure, that vested her rather with beauty than with warmth. The echo, which was seldom awakened in the cold season, now returned to delight the ear of Amaryllis. Lycidas had united to the modulation of instrumental the charm of vocal music. But hitherto they were spontaneous and casual expressions of passion, without measure or design;

design; and, like the origin of human language, little more than natural ejaculations of the heart. Of late they had taken a new form; something they had of art, and they became POETRY. He perceived that Amaryllis felt an ecstasy of pleasure, when in the snowy season, reclined by the social blaze, he brought to her recollection the scenery of summer. The ideas of the sun, the shades, and the waters, delighted her in the winter; it was the cherished picture of Nature in her absence; and she felt the same pleasure in the vivid description, as when she contemplated the portrait of Lycidas on their separation. She called these descriptions painting in thought. Lycidas gradually discovered that his chaunt was susceptible of order, and that it communicated a pleasurable sensation when it solicited the ear by certain pauses and cadences; this produced metre, or *blank verse*. They were exquisitely gratified when they found the art of describing one object by another, as Amaryllis termed it; and this opened an eternal source of metaphors and images. Yet to this rude, though not unpleasing, poetry, was still wanting a peculiar charm; that artifice which at once combines the pleasing returns of uniformity with the diversifications of variety. This appeared when Amaryllis one day, listening to the echo, inquired of Lycidas, What is this mysterious flight that my voice takes? What is echo?—It is (said Lycidas) the mirror of the voice!—Then it is not (he continued) the voice itself? The liquid glass that reflects our forms is not a part of our forms!—Be not over-curious, Amaryllis; for thee it is sufficient to sport with the mimic sound. I cannot invent an echo; the gods preserve their own secrets.—The playful echo ever delights me, said Amaryllis; but, when I call on thee, and thou hearest me not, then, in cruel mockery, as I say ‘Lycidas, Lycidas!’ it only replies ‘das, das!’ Thou seest the echo is irrational; for it never answers but by the last syllable.—Ye gods! exclaimed the enthusiastic Lycidas; thou lovest the repeating accent of the echo: I can invent an echo! I will close my verses with a reverberating sound.—Every line was now answered by an echoing line. Such was the origin of *rhime*.

It was in the luxuriance of summer that Amaryllis perceived her abode had still some wants. This spot, selected by Lycidas for its amenity and forest-trees, was not stored with rural luxuries. Lycidas passed many hours in returning to their ancient cavern for its neighbouring fruits; every day he toiled beneath a panier filled with the Arcadian food; but, whenever he neglected to bring a copious lap of the freshest flowers, Amaryllis tenderly chid him; and often with a sigh complained to Lycidas, that their trees were without fruit, and their soil without flowers. She had lamented so frequently that he never brought enough roses and hyacinths, that, one day, having found a rose-tree whose roots had been loosened in the soil, he easily extracted it, and threw it at the feet of Amaryllis. She exclaimed, Beauteous family of flowers, ye will all perish at once! for your violated and tender society, severed from your natal spot, pine in a foreign air; while ye yield your soothing odours, no maternal earth will supply you with new sources of existence; every breath of air ye fill with sweetness, and in every breath ye are dying: prodigal of your cherished existence, a tender regret disturbs us in the moment of pleasure. Lycidas, I will bury them in the sod that covers the lamb we buried last week.—She made a cavity in the earth,

earth, in which she deposited the rose-tree. The transplanted roses struck their roots in the soil; the bush flourished to their wondering eye, and graced their habitation with its solitary beauty. Another discovery! more roses and more hyacinths! Every pleasing plant they met in their walks became domiciliated; they passed hours in herbalising; and in the succeeding summer the forest air was sweetened with new odours, and a *flower-garden* embellished their solitude.

But to have thus accidentally discovered the arts of planting and transplanting, was not sufficient for the propagation of their trees. Their horticulture was still imperfect. They perceived, with equal disappointment and surprise, that the vines, most luxuriant in leaves, were barren; while others, of thinner foliage, were prodigal of fruit. Amaryllis wondered, and Lycidas reflected. He observed that the vine, yielding the most abundant fruit, was one which a favourite goat was allowed to browse. He observed; he meditated; he stole the hint. He lopped the branches of the vines. And it was the goat who first shewed to man the art of *pruning*.

The procuring of wild honey from the cavities of old trees and the clefts of rocks, was often an uncertain pursuit and an insufficient resource. Another inquietude, another want, another invention! They watched a little populace of foraging bees busy on their ambrosial repast, spoiling the farina of flowers or pressing the tops of the stamina, and thus anticipating the cautious œconomy of Nature. The amusing sound! when they plunge their little velvet heads in the calix of a flower, and pierce through the resisting petal, while the sudden silence expresses the ardent pillage. Did they track the vagrants to their waxen tower? There, a new idea of society gave a sublime emotion to our two solitaries. They traced order in a multitude; they viewed a city and its inhabitants; and, with a delicious joy, Amaryllis discovered the queen-bee. She exclaimed, in contemplating their symmetrical, solid, and convenient, cells; those finely planned edifices for thousands of the living,—Lycidas, thou must acknowledge the architecture of the little bees is more wonderful than thine.—It is more perfect (replied Lycidas); for these fabrics are just adapted to their inmates, while in our palace there are a hundred things to add and to amend.

They instructed themselves in the human passions (of which they were strangers to many) in meditating on this society. Innumerable offices of affection penetrated their hearts with the sensibility of humanity.

Lycidas having observed that the bees were ever settling on aromatic plants, on the thyme, the rosemary, the sage, and rested long on the flowers of the lime, he planted, on the southern steep of his valley, numerous beds of balmy flowers, and odoriferous herbs.—Want (said Lycidas), and not caprice, urges their restless flight; they are not volatile, but diligent. I can afford the wanderers a resting spot; perhaps they may make it a home; and we will interchange our mutual industry.

What he imagined, succeeded. The explorers of sweets soon discovered the new world; the aromatic land inspired a thousand adventurers, who, constant to pleasure, knew no other native spot than where pleasure was found. The queen followed the colony; they then built their cells, and peopled, with dark clusters, the

pendent

pendent boughs. The voice of the bee was musical beneath the solitary heaven of our lovers. Such was the origin of an *apiary*, or bee-garden!

They had now much advanced in the art of painting; but as they only employed their pencils from a spirit of gaiety, and a passion for decoration, the sublime inventions of the art were not yet conceived; the ideal was unknown, but the exactest imitation was practised. They knew well to copy the purple bloom of the fruit as it hung on the tree, and the brilliant tint of the flower as it caught the sunbeam on its native stalk. They had mutually attempted to paint their own portraits; but the progress of such an elaborate piece had ever been interrupted by the tedious labour of the unskilled artist and the restlessness of the lively model. With more success they copied animals and insects. But love had inspired Lycidas to adorn the corner of the apartment occupied by Amaryllis. There he continually sketched the thousand capricious images dancing in his brain. The curious wall was gradually covered with fantastic forms, and exhibited a constant spectacle of fancy. Now the bower of Amaryllis was there elegantly festooned, and the tendrils of vines were happily flourished by a stroke of the pencil; now, as his humour prompted, the fibres of the leaves were transparently laboured, while on a delicate stem hung the finished petal of an unfinished flower: sometimes he copied a silken white fillet, with which Amaryllis circled her head-dress, binding it with scarlet flowers, glowing in the midst of their green leaves; sometimes he laboriously finished chimerical figures, which partly resembled human forms, but frequently terminated in that of some animal, or wore some ridiculous disproportion, provoking laughter; and sometimes the face of the volatile Amaryllis ending with the plumage of a bird, or the mottled wings of a butterfly. It was now a torrent foaming on rocks, and now a rivulet shaded with elms, whose silvery line was poured through the transparent umbrage. Every object they admired in their walks, on his return was sketched or finished on the wall. 'Twas now a tree, a prospect, or the clouds! But the Loves and the Graces often guided his deliriums of imagination, and the wall recorded the short annals of their lives, and pictured the epochas of his various inventions. There, were seen the first oversetting of the fish of wood; there himself breathing his first flute, and Amaryllis sketching his first shade. The fantastic scenery, airy or solemn, sketched or elaborate, inspired mirth, fancy, and love. Such was the origin of the playful arabesque, or grotesque paintings.

Around their house was an ornamented scenery; but as they sometimes bewildered themselves in the neighbouring valleys, or were desirous of indicating some particular spot, they invented local names, which were derived from some circumstance. One place was distinguished by the Kiss; and another, where Amaryllis, including Lycidas, as he chased the laughing fugitive, tumbled down the hill, was called the Fall; a fine walk near the lake, through hedges of the arbutus, was known by the name of the Strawberry Walk; and a valley, luxuriant in flowers, by the title of the Summer Seat. There was a favourite spot called the Ruins of May. One morning in that month Amaryllis lay there asleep; Lycidas passed, and observed the indolent maid. He hastened to the hedges,

which were then in full flower, and despoiled them; and, having gathered a panier full of May blossoms, he quietly covered the sleeping beauty with their fragrant snows. She awoke in a cloud of streaming odours, while her pleasure-twinkling eye wondered at the flowery vest that covered her. Chiding her playful lover for this waste of the young year, the fact was recorded in the name given to the place, thence called "The Ruins of May." A similar origin is that of most local names.

What now remained to perfect the felicity of our two solitaires? Their earth was tinted with brilliant flowers; their trees bowed their branches with delicious fruit; their air was musical with the volant bee; they glided on the river with a happy audacity; the melodies of the nightingale were in their flutes; and consolation of absence was found in the pictured form, and the gaiety of a playful pencil embodied their fantastic imaginations; the charm of an artificial echo resounded in their verses, while they traced in their palace the columns which memorised their affections. The enchanting miracles of art long fascinated their eye, vibrating in their hearts the tranquil emotions of beauty; while the innocent voluptuousness which nature threw around them, solicited their enjoyment. Often they now turned from the productions of Nature and of Art, to gaze on each other: an interior sensation, an unknown desire, a querulous anxiety, existed in their hearts, and every day their felicity was diminished.

One day, as they sat beside an expansive lake, they beheld two swans sailing on the stream; images of majesty, of grace, and of peace! Our lovers reclined, admiring each form of elegance, and the luminous whiteness of their plumage, and all the variety and freedom of their animated attitudes. The male was intent to attract the admiration of the female; anxious to discover the concealed graces of his beauty, yet anxious with pride. He arranges his splendid plumage; he throws the trailing water from his beak along his shining back and over his freshened wings with the fond solicitude of that being who knows the pleasure of being loved. All his figure respires voluptuousness. He approaches her; he flaps his pinions, and the feathery snow sparkles. With a preluding caress, they wind their sinuous necks around each other; their wings yield a confused sound, and some white feathers fall on the disturbed lake. A continued embrace unites them. They pursue each interchange of delight; they feel all the shades of sensibility, and faint in the ebriety of the senses. At length the male is no more majestic; he is only tender, and lies indolently along the trembling waters. Again the female returns to her lover; again inflames him; again incites his last ardours; and only quits him reluctantly, but to plunge into the stream, and to extinguish the fires that still glow in her agitated form.

When the lovers had gazed on the affectionate swans, they turned to each other, and sighed. Lycidas snatched some feathers of the swans as they floated by them, and kissed them.—How they know (he cries) to love, and to render their love the source of their felicity! O Amaryllis! why is not the sense of our existence the sense of our happiness! Shall we become old without having known enjoyment?

Children

Children of Nature ! the universal parent prepares for ye the maturity of happiness ! she gives ye the soft pains ye now suffer, to render the fine pleasures she will bestow on ye more exquisite and pure. It is only in a corrupt society curiosity anticipates passion ; the energy of passion irritates your senses, but ye do not irritate your senses to obtain the energy of passion. Souls of chastity ! when ye meet ye know yourselves worthy of each other ; your first embrace is the prelude of eternal confidence, and your voluptuousness is in proportion to your virtue !

FRY'S PANTOGRAPHIA, just published,

Containing accurate Copies of all the known ALPHABETS in the World,
and Specimens of all well-authenticated ORAL LANGUAGES.

THIS Work could not have been dedicated to any one with more propriety than to the President of a Society for the Encouragement of all Arts, of which the arrangement of words, sentences, &c. originating in some alphabet, are the great diffusers and promulgators. It must long have been reckoned one of the *desiderata* of literature ; and it now comes forth to the public with a neatness and accuracy of delineation not less honourable to Mr. Fry as a letter-founder, than agreeable to the curious and intelligent inspector.

In the Preface, Mr. Fry has entered, we know not whether necessarily, into the grand question of the origin of Language in general ; whether it arises from divine inspiration, or human invention ; a question which no man can hardly flatter himself with bringing to a decision. It is agreeable to find those arguments on both sides which are diffused through a great variety of volumes, many of them unattainable to the common reader, brought under one view, and opened to general investigation. It is a field of speculation on which thinking men have long indulged their researches, and on which sacred history being silent, the diversity of opinions may perhaps serve to invigorate, without improperly warping, the human faculties.

We must, however, be permitted to doubt whether by any thing there adduced men of either side will become converts to the opinions of the other. If man has never been found without the power and habit of articulating to a certain degree, surely the latter as well as the former may be deemed an essential property of his nature. The idea of inspiration on this subject seems, when properly investigated, ultimately to resolve itself into a capacity of attaining certain ends by proceeding through certain means ; every one of which have their origin mediately or immediately from the Deity. These observations apply more strongly to the invention of articular oral language than of alphabetical writing ; the latter of which the Chinese have never yet acquired by the mere light of natural reason.

The design of the work is, in the words of the Editor, " To promote the diffusion of science, which is effected in all cases by facilitating the communication of ideas, at present done by means of oral or written language only." And he thus proceeds to the illustration of his design :—" The limits prescribed to this volume render it impossible for the Author to enter into minute details or

anecdotes even of the most important languages : his view is rather to give an *outline* of the *subject* ; to shew what is *commonly known*, and to put it in the power of Philologists to extend the sphere of our knowledge ; and to furnish them with a center of communication to which their discoveries and researches may be directed : he has, therefore, only given what he promised, hoping it will enable his friends, and critics, to state the errors, omissions, redundancies, &c. which he will endeavour to rectify on some future occasion. No extensive work was ever brought to perfection at once ; but something must be begun to form a ground for criticism and improvement."—Mr. Fry afterwards says, "The principal object of an undertaking of this nature is to exhibit *correct copies or representations* of those alphabets which are at present known : for this purpose the author has spared no pains or expence in procuring the most authentic originals and engraved copies which have come to his knowledge."

For the latter part of this sentence full credit will be given to the author, when it shall be known that he presents the literary world with copies of about *two hundred alphabets*, amongst which are eighteen varieties of the Chaldee, and no less than thirty-two of the Greek ; of which language we find the following anecdote : "Before the victories of Alexander, this language was principally confined to Turkey in Europe, Sicily, Dalmatia, Anatolia, and the Islands of the Archipelago : his generals and successors extended it over many parts of Asia and Egypt : so that, from the time of Alexander to that of Pompey, it may be considered as having been the most general language ; and what is truly astonishing, it continues to be spoken in a manner which would have been intelligible to the ancient inhabitants of Greece. This is perhaps an instance of the greatest longevity of language : few others have continued living and intelligible more than 500 years, whereas Greek has survived 3500 years. The causes of this will be found in the structure of the language itself, the extent of its use, and the great merit of the authors who have written in it. The New Testament (as well as the early fathers) is also written in Greek."

In the search after these characters, Mr. Fry must have turned over numberless volumes, and he cites not less than fifty different works. Besides these alphabets, we are presented with 180 readings of the Lord's Prayer, and above seventy specimens of other kinds, in various languages and dialects, or in exemplifications in English letters, in order to convey to the British reader some idea of their sound and structure. Amongst the alphabets, a striking pre-eminence of simplicity of character appears, [p. 164,] in the first of the two alphabets called *Irish Ogums*, one named *Croab*, and the other *O'Sullivan's* ; and which being, we are told, "derivations from Roman notes, were first *Stenographic*, then *Steganographic*, then *Magical*, and lastly *Alphabetic*—*Oga*, *Ogum*, and *Ogma*, are Celtic words, implying letters written in cypher, and indirectly an occult science. *Ogan*, in Welsh, is *Augury*, *Divination*."

The specimen of the translation of Pope's "Universal Prayer," into the Malay language, by Captain Forrest, is by no means the least curious or interesting passage in the work to us, as countrymen of that metaphysical poet. We may be apt to forget that this celebrated poem has assisted but too much in the propagation of *deism*, while we consider with pride, that the thoughts and the diction

charm

charm in remote regions, and spread the fame of the poet's genius over realms divided from us by half the habitable world.

Among the characters appears a set said to have been used by Adam; as others by Noah, Seth, and Abraham. Such a tradition proves, at least, their very remote antiquity; though, as Mr. Fry properly remarks, no one would vouch for their authenticity: "but, in a work professing to exhibit all, it was thought proper to give those met with on respectable authority."

We should wish to have seen added to the list of subscribers to this curious work the names of the various Universities. Its object must be deemed well worthy their attention; while its neatness, and the care bestowed in its execution, are highly commendable.

We shall conclude this slight sketch of a work which cannot but interest the votaries of literature, with the concluding sentence of the Preface. By this Mr. Fry bespeaks that lenity which men of real learning, as most competent to judge of the difficulties of such undertakings, are ever most ready to afford; and displays a diffidence, (the mark of true merit,) naturally arising from the experience of inaccuracy in others, and of the difficulty of avoiding it in an attempt of this nature: "If his feeble endeavours may be hereafter found to have been in any degree of service to the literary world, and a future amended edition or supplement to the *Pantographia* may meet encouragement, as the plan is now before the public, he will solicit the kind assistance of the antiquary, the virtuoso, and every gentleman possessed of an alphabet or specimen of oral language of good authority, which shall be faithfully given in the work. He is sensible that in a work of this kind the candid critic may find many opportunities for the display of his learning and *acumen*; but he hopes the novelty, extent, and importance, of the subject, will shield his errors or omissions from the severity of censure."

REMARKS ON THE CHINESE LANGUAGE.

IN Chinese, there are scarcely fifteen hundred distinct sounds. In the written language, there are at least eighty thousand characters, or different forms of letters; which number, divided by the first, gives nearly fifty senses, or characters, upon an average, to every sound expressed: a disproportion, however, that gives more the appearance, than the reality, of equivocation and uncertainty to the oral language of the Chinese. Johnson's English Dictionary affords instances of words taken in upwards of one hundred different senses, without any doubt being thereby felt in English conversation; where, indeed, if there were, no recourse can be had for ascertaining its precise sense, as in the Chinese, to the form of the written character, peculiar to each sense in which the word is received.

The number of words in any language, or at least of senses in which each word is understood, must depend chiefly on the state of civilization to which the people that use it are arrived; and in some degree also, on the population of the country, and on the arts flourishing among them. It is not surprising, therefore, that the Chinese dictionary should contain, at least, eighty thousand characters. Perhaps if every sense in which an English term is sometimes received, were considered as a distinct word, and the vast variety of those

those employed in the different arts and occupations of life, were taken into account, the number would not be much fewer than that of the Chinese.

The characters of the Chinese language were originally traced, in most instances, with a view to express either real images, or the allegorical signs of ideas: a circle, for example, for the sun, and a crescent for the moon. A man was represented by a erect figure, with lines to mark the extremities. It was evident that the difficulty and tediousness of imitation will have occasioned soon a change to traits more simple, and more quickly traced. Of the entire figure of a man, little more than the lower extremities only continue to be drawn, by two lines forming an angle with each other. A faint resemblance, in some few instances, still remains of the original forms in the present hieroglyphic characters; and the gradation of their changes is traced in several Chinese books. Not above half a dozen of the present characters consist each of a single line; but most of them consist of many; and a few of so many as seventy different strokes. The form of those characters has not been so flux as the sound of words, as appears in the instance of almost all the country bordering on the Chinese sea, or Eastern Asia, where the Chinese written, but not the oral, language, is understood; in like manner as one form of Arabic figures to denote numbers, and one set of notes for music, are uniform and intelligible throughout Europe, notwithstanding the variety of its languages.

A certain order of connection is to be perceived in the arrangement of the written characters of the Chinese; as if it had been formed originally upon a system to take place at once, and not grown up, as other languages, by slow and distant intervals. Upwards of two hundred characters, generally consisting each of a few lines or strokes, are made to mark the principal objects of nature, somewhat in the manner of Bishop Wilkins's divisions, in his ingenious book on the subject of universal language, or real character. These may be considered as the genera, or roots of language, in which every other word, or species, in a systematic sense, is referred to its proper genus. The "heart" is a genus of which the representation of a curve line approaches somewhat to the form of the object; and the species referable to it include all the sentiments, passions, and affections, that agitate the human breast. Each species is accompanied by some mark denoting the genus, or heart. Under the genus "hand," are arranged most trades and manual exercises. Under the genus "word," every sort of speech, study, writing, understanding, and debate. A horizontal line marks a unit; crossed by another line, it stands for ten, as it does in every nation which repeats the units after that number. The five elements of which the Chinese suppose all bodies in nature to be compounded, form so many genera, each of which comprehends a great number of species under it. As in every compound character or species, the abridged mark of the genus is discernible by a student of that language, in a little time, he is enabled to consult the Chinese dictionary, in which the compound characters, or species, are arranged under their proper genera.

The characters of these genera are placed at the beginning of the dictionary, in an order, which, like that of the alphabet, is invariable, and soon becomes familiar to the learner. The species under each genus follow each other, according to the number of strokes of which

which each consists, independently of the one, or few, which serve to point out the genus. The species wanted is thus soon found out. Its meaning and pronunciation are given through other words in common use, the first of which denotes its signification, and the other its sound. When no one common word is found to render exactly the same sound, it is communicated by two words, with marks, to inform the inquirer that the consonant of the first word, and the vowel of the second, joined together, form the precise sound wanted.

The composition of many of the Chinese characters often displays considerable ingenuity; and serves also to give an insight into the opinions and manners of the people. The character expressive of happiness, includes abridged marks of land, the source of their physical, and of children, that of their moral, enjoyments. This character, embellished in a variety of ways, is hung up almost in every house. Sometimes, written by the hand of the emperor, it is sent by him as a compliment, which is very highly prized; and such as he was pleased to send to the late ambassador, Lord Macartney.

Upon the formation, changes, and allusions, of compound characters, the Chinese have published many thousand volumes of philosophical learning. No where does criticism more abound, or is more strict. The introduction or alteration of a character, is a serious undertaking, and seldom fails to meet with opposition. The most ancient writings of the Chinese are still classical amongst them. The language seems in no instance to have been derived from, or mixed with, any other. The written seems to have followed the oral language soon after the men who spoke it were formed into a regular society. Though it is likely that all hieroglyphical languages were originally founded on the principles of imitation, yet, in the gradual progress towards arbitrary forms and sounds, it is probable that every society deviated from the originals, in a different manner from the others; and thus for every independent society, there arose a separate hieroglyphic language. As soon as a communication took place between any two of them, each would hear names and sounds not common to both. Each reciprocally would mark down such names, in the sounds of its own characters, bearing, as hieroglyphics, a different sense. In that instance, consequently, those characters cease to be hieroglyphics, and were merely marks of sound. If the foreign sounds could not be expressed but by the use of a part of two hieroglyphics, in the manner mentioned to be used sometimes in Chinese dictionaries, the two marks joined together become in fact a syllable. If a frequent intercourse should take place between communities, speaking different languages, the necessity of using hieroglyphics merely as marks of sound would frequently recur. The practice would lead imperceptibly to the discovery that, with a few hieroglyphics, every sound of the foreign language might be expressed; and the hieroglyphics, which answered best this purpose, either as to exactness of sound, or simplicity of form, would be selected for this particular use; and, serving as so many letters, would form, in fact, together, what is called an alphabet.

This natural progression has actually taken place in the city of Canton, where, on account of the vast concourse of persons, using the English language, who resort to it, a vocabulary has been published of English words in Chinese characters, expressive merely of sound, for the use of the native merchants concerned in foreign trade; and
who,

who, by such means, learn the sound of English words. To each character is annexed a mark, to denote that it is not intended to convey the idea, but merely the foreign sound attached to it. The habit of applying the sound, instead of the meaning of hieroglyphics, to foreign words, led to the application of them likewise as sounds, to assist the memory in the pronunciation of other hieroglyphics in the same language, but not in common use; and the repeated application of them for those purposes may be at length supposed to have effaced their original use. Thus the passage from hieroglyphic to alphabetic writing may naturally be traced, without the necessity of having "recourse to divine instruction," as some learned men have conjectured "on the ground that the art of writing by an alphabet is too refined and artificial for untutored reason." It is indeed, equally natural to suppose that no such art could have preceded the establishment of hieroglyphic, as that a mixture of other nations superinduced the invention of alphabetic language. The exclusive existence of the former still in China is a proof and an instance, that the number of foreigners who had ever found their way among them, as the Tartars, for example, however warlike and victorious, bore so very small a proportion to the vanquished, that it introduced no more a change in their usages and manners, than in their language.

The principal difficulty, in studying Chinese books, arises from the general exclusion of the auxiliary particles of colloquial language. The Chinese characters are in fact sketches, or abridged figures; and a sentence is often a string of metaphors. The words of an alphabetic language may be read without the least knowledge of their meaning; not so the hieroglyphic language, which is only to be learned by becoming acquainted with the signification or notion attached to each mark. A dictionary of hieroglyphics is less a vocabulary of the terms of one language with the correspondent terms in another, than an encyclopedia, containing explanations of the ideas themselves, represented by such hieroglyphics. In this sense, only, can the acquisition of Chinese words be justly said to engross most of the time of men of learning among them. To excel in language is to excel in learning; and to be master of the Chinese language is to understand all the arts and sciences, as far they have been improved, and are known, among that people.

ON CANNIBALISM.

THE first inducement which can lead men to this excess is extreme hunger; but, however pardonable it may be under such circumstances, if the flesh used be that of dead bodies, it is highly detestable on account of the consequences. During a dreadful famine in India, which destroyed more than an hundred thousand persons, when the roads and streets were covered with dead bodies, because people had not sufficient strength to inter them, several had the resolution to preserve their lives by this disgusting food; but some of them, though not many, found it so delicious, that, when the famine was at an end, they retained such an irresistible propensity to human flesh, that they lay in wait for the living in order to devour them. Besides others, there was a mountaineer, who concealed himself in a forest near the highway, where he used to cast a rope,

with a noose, over the heads of the passengers, whom he afterwards cut to pieces to gratify his unnatural appetite. He killed many persons in this manner, but he was at length caught and executed. At the same time, and owing to the same cause, a woman used to go out for the express purpose of carrying away children who had strayed from their homes. She stopped up their nose and mouth with clay, that they might not call out for assistance, and by these means suffocated them. She confessed the fact on being taken, and some salted human flesh was found in her habitation.

The reason of the second inducement to anthropophagy will now be readily comprehended. We read in different works, both ancient and modern, that many nations, in various parts of the world, have killed men, not on account of famine, but of the delicious taste of human flesh, which they not only fed upon but publicly sold.

The third inducement, that people eat their deceased relations by way of shewing them honour, seems to be as romantic as it is repugnant to nature; yet there are many authors, from Herodotus, the Father of History, down to modern times, who assert that this practice has prevailed among various nations.

A fourth incitement to eat human flesh is hatred and revenge. There is a law in Cochinchina, that all rebels, when convicted of their crime, shall be executed, and that their flesh shall be devoured by the king's loyal subjects, and, in particular, by those who are nearest his person.—At the time I resided in that country, several executions of this kind took place. The men were beheaded, but the women were stabbed. After the execution, the soldiers who guarded the palace flocked around the bodies, and each cutting off, with a pocket knife, a small piece, dipped it in the juice of an unripe lemon, and in that manner swallowed it. But as the size of the morsel is not determined by the law, and as most of the people have an aversion to such food, many suffer the bit of flesh to drop through their fingers, and swallow only the lemon.

At the time when the Cochinese were at war with the Mois, a people who inhabit the mountains to the west, and who often make incursions into their territories, the Cochinese general marched with an army towards the mountains; but as he was not able to get at the enemy, on account of their inaccessible situation, he ordered two prisoners he had taken to be put to death, and their flesh to be devoured by his soldiers.

In the year 1777, being on-board an English ship of war in Turon harbour, in order to return from Cochinchina to Europe, a party arrived there who had joined a powerful rebel, named Nhae. This leader and his party had taken some of the king's confidential friends, and one in particular, who had formerly done him a great deal of injury. The latter they put to death; and, in order to gratify their revenge, they tore out his liver and ate it. The Cochinese, in general, when violently incensed against any one, are accustomed to express a wish that they may be able to devour his liver or his flesh.

AMERICAN DISCOVERIES.

EXTRAORDINARY pains are said, in the Philadelphia papers, to be taken at this time, by more European nations than one, to send enterprising travellers to explore the interior regions of America.

REMEDY FOR THE BITE OF A SNAKE.

A Mr. Stewart, said to be in the employ of the British court, has long since returned from four years travels through the hitherto unexplored regions to the westward. Taking his course west and south-westerly from the ports on the lake, he penetrated to the head of the Missouri, and thence due west, to within about a hundred miles of the Pacific Ocean. Nothing prevented his reaching the coast but an inveterate war, which had for some time been carried on, with all the implacability of savage revenge, between the interior Indians and those towards the sea-coast-parts. So great, however, was the ardour of the enterprising Mr. Stewart to attain his object (the exploring from sea to sea), that he joined the Interior Indians in several battles against the Shore Indians; all of which coming short of his object, the procuring peace, after some stay, he returned nearly by the route he had pursued going. Our information adds, that, beyond the Missouri, Mr. Stewart met with many powerful nations of savages, in general hospitable and courteous. The Indian nations he visited westward appeared to be a polished civilized people, having regularly-built towns, and being in a state of society not far removed from Europe, clad in skins cut in an elegant manner, and in many respects preferable to the garments in use among the whites. Adjacent to these nations is a vast range of mountains, which may be called the Alleghany of the western parts of America, and serves as a barrier against the too frequent incursions of the Coast Indians, who entertain a mortal antipathy to the nations and tribes inhabiting the eastward beyond the mountains.

REMEDY FOR THE BITE OF A SNAKE.

THE following is given as a new discovery of an infallible remedy for the bite of venomous snakes.

To JAMES ANDERSON, Esq. M. D. Physician-general, &c. &c.

DEAR SIR, I have the pleasure to send you the history of a case, which was attended with most alarming symptoms, as a confirmation of the beneficial effect to be expected from the use of Eau de Luce, or Spirits of Hartshorn, in the bites of even the most dangerous snakes. On the 11th of this month, at half past three o'clock, P. M. one of the Dooley Bearers of the 2d regiment of cavalry, in the act of cutting a branch of a tree about one hundred yards from my house, was bit by a snake on the outside of the left leg, a little below the knee. He felt immediately the pain stretching up his thigh, and in the course of ten or twelve minutes, he was seized with violent spasms all over his body, and fell down, apparently without sense or motion. He was then brought to me, when I found all his joints quite stiff, his limbs rigidly extended, pulse hardly to be felt, and jaws fast locked. Having no Eau de Luce at hand, I put a tea-spoonful of Hartshorn into a tumbler with a small quantity of water, and, having with difficulty opened his mouth by means of a turn-screw, I poured it in, but, the power of deglutition being perfectly gone, only a very small part found its way to the stomach; in ten minutes more I repeated the draught, and again a very small quantity got to the stomach; ten minutes after I gave him another dose, when, by holding his head back, the greatest part went down, and in a few minutes he was sensibly relieved, as his joints became

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more pliable. I now received some Eau de Luce, and in about ten minutes gave him about twenty-five drops mixed with a little water, which, by holding his head as before, got all into his stomach. He now began to recover his recollection, and, upon being asked, pointed that he felt a pain in the breast, and the crown of his head. Half an hour after giving the last dose I repeated it, and in about five minutes he was seized with vomiting, when he brought up a small quantity of green slimy matter, which seemed to relieve him greatly, for he was then able to look about him. I repeated the medicine every half hour, and after every dose he got a little better, so that at nine o'clock he was able, with a little support, to walk home from my house, scarcely feeling any effect but weakness from the bite, and I saw him next morning perfectly well. During the internal exhibition of the medicine, the wound was rubbed with it, and seemingly with some good effect. The snake was not killed, so that I cannot say what species it was of, but, from the violent effects produced by its bite, I have no doubt of its being a very dangerous one.

ARCOT, *Nov.* 13, 1798.

WILLIAM MACKINTOSH.

COMPARISON BETWEEN THE HUMAN RACE AND THAT OF SWINE.—By I. F. BLUMENBACH.

SOME late writers on natural history seem doubtful whether the numerous distinct races of men ought to be considered as mere varieties, which have arisen from degeneration, or as so many species altogether different. The cause of this seems chiefly to be, that they took too narrow a view in their researches; selected, perhaps, two races the most different from each other possible, and, overlooking the intermediate races that formed the connecting links between them, compared these two together; or, they fixed their attention too much on man, without examining other species of animals, and comparing their varieties and degeneration with those of the human species. The first fault is, when one, for example, places together a Senegal negro and an European Adonis, and at the same time forgets that there is not one of the bodily differences of these two beings, whether hair, colour, features, &c. which does not gradually run into the same thing of the other, by such a variety of shades, that no physiologist or naturalist is able to establish a certain boundary between these gradations, and consequently between the extremes themselves.

The second fault is, when people reason as if man were the only organised being in nature, and consider the varieties in his species to be strange and problematical, without reflecting that all these varieties are not more striking or more uncommon than those with which so many thousands of other species of organised beings degenerate, as it were, before our eyes.

As my observations respecting the bodily conformation and mental capacity of the negroes may serve to warn mankind against the first error, and at the same time to refute it, I shall here offer a few remarks to refute the false conclusion which might be formed from a careless comparison of the degenerations among the human race with the varieties among other animals, and for that purpose shall draw a comparison between the human race and that of swine.

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More reasons than one have induced me to make choice of swine for this comparison; but in particular, because they have a great similarity, in many respects, to man: not, however, in the form of their entrails, as people formerly believed, and therefore studied the anatomy of the human body purposely in swine; so that even, in the last century, a celebrated dispute, which arose between the physicians of Heidelberg and those of Durlach, respecting the position of the heart in man, was determined, in consequence of orders from government, by inspecting a sow, to the great triumph of the party who really were in the wrong. Nor is it because in the time of Galen, according to repeated assertions, human flesh was said to have a taste perfectly similar to that of swine; nor because the fat and the tanned hides of both are very like to each other; but because both, in regard to the economy of their bodily structure, taken on the whole, shew unexpectedly, on the first view, as well as on closer examination, a very striking similitude.

Both, for example, are domestic animals; both *carnivora*; both are dispersed throughout all the four quarters of the world; and both consequently are exposed, in numerous ways, to the principal causes of degeneration arising from climate, mode of life, nourishment, &c. both, for the same reason, are subject to many diseases, and, what is particularly worthy of remark, to diseases, rarely found among other animals than men and swine, such as the stone in the bladder; or to diseases exclusively peculiar to these two, such as the worms, found in measles swine.

Another reason, however, why I have made choice of swine for the present comparison is, because the degeneration and descent from the original race are far more certain in these two animals, and can be better traced, than in the varieties of other domestic animals. For no naturalist, I believe, has carried his scepticism so far as to doubt the descent of the domestic swine from the wild boar; which is so much the more evident, as it is well known that wild pigs, when caught, may be easily rendered as tame and familiar as domestic swine: and the contrary also is the case; for, if the latter by any accident get into the woods, they as readily become wild again, so that there are instances of such animals being shot for wild swine; and it has not been till they were opened and found castrated, that people were led to a discovery of their origin, and how and at what time they ran away. It is well ascertained, that, before the discovery of America by the Spaniards, swine were unknown in that quarter of the world, and that they were afterwards carried thither from Europe. All the varieties, therefore, through which this animal has since degenerated, belong, with the original European race, to one and the same species; and since no bodily difference is found in the human race, as will presently appear, either in regard to stature, colour, the form of the cranium, &c. which is not observed in the same proportion among the swine race, while no one, on that account, ever doubts that all these different kinds are merely varieties that have arisen from degeneration through the influence of climate, &c. this comparison, it is to be hoped, will silence those sceptics who have thought proper, on account of these varieties in the human race, to admit more than one species.

I. *In regard to Stature.*—In this respect the Patagonians, as is well known, have afforded the greatest employment to anthropologists. The romantic tales, however, of the old travellers, who give to these

these inhabitants of the southern extremity of America a stature of ten feet and more, are scarcely worth notice; and even the more modest relations of later English navigators, who make their height from six to seven feet, have been doubted by other travellers, who, on the same coast, sought for such children of Enoch in vain. But we shall admit every thing said of the extraordinary size of these Patagonians, by Byron, Wallis, and Carteret, the first of whom assigns to their chief, and several of his attendants, a height of not less than seven feet, as far as could be determined by the eye; the second, who asserts that he actually measured them, gives to the greater part of them from 5 feet 10 inches to 6 feet; to some 6 feet 5 inches, and 6 feet 6; but to the tallest, 6 feet 7 inches: and this account is confirmed by the last-mentioned of the above circumnavigators. Now, allowing this to be the case, it is not near such an excess of stature as that observed in many parts of America among the swine, originally carried thither from Europe; and of these I shall mention in particular those of Cuba, which are more than double the size of the original stock in Europe.

II. *In regard to Colour, and the Nature of Hair.*—The natives of Guinea, Madagascar, New Holland, New Guinea, &c. are black; many American tribes are reddish brown, and the Europeans are white. An equal difference is observed among swine in different countries. In Piedmont, for example, they are black. When I passed through that country, during the great fair for swine at Salenge, I did not see a single one of any other colour. In Bavaria, they are reddish brown; in Normandy, they are all white.

Human hair is, indeed, somewhat different from swine's bristles, yet in the present point of view they may be compared with each other. Fair hair is soft, and of a silky texture; black hair is coarser, and among several tribes, such as the Abyssinians, Negroes, and the inhabitants of New Holland, it is woolly, and most so among the Hottentots. In the like manner, among the white swine in Normandy, as I was assured by an incomparable observer, Sulzer of Ronneburg, the hair on the whole body is longer and softer than among other swine; and even the bristles on the back are very little different, but lie flat, and are only longer than the hair on the other parts of the body. They cannot, therefore, be employed by the brush-makers. The difference between the hair of the wild boar and the domestic swine, particularly in regard to the softer part between the strong bristles, is, as is well known, still greater.

III. *In regard to the Form of the Cranium.*—The whole difference between the cranium of a negro and that of an European, is not in the least degree greater than that equally striking difference which exists between the cranium of the wild boar and that of the domestic swine. Those who have not observed this in the animals themselves, need only to cast their eye on the figure which Daubenton has given of both.

I shall pass over less national varieties which may be found among swine as well as among men, and only mention that I have been assured by Mr. Sulzer that the peculiarity of having the bone of the leg remarkably long, as is the case among the Hindoos, has been remarked with regard to the swine in Normandy. "They stand very long on their hind legs," says he, in one of his letters; "their back, therefore, is highest at the rump, forming a kind of inclined plane;

plane; and the head proceeds in the same direction, so that the snout is not far from the ground." I shall here add, that the swine, in some countries, have degenerated into races which in singularity far exceed every thing that has been found strange in bodily variety among the human race. Swine with solid hoofs were known to the ancients, and large herds of them are found in Hungary, Sweden, &c. In the like manner the European swine, first carried by the Spaniards in 1509 to the island of Cuba, at that time celebrated for its pearl-fishery, degenerated into a monstrous race, with hoofs which were half a span in length.

ON FEMALE EDUCATION.—By Miss HANNAH MORE.

THOSE ladies who take the lead in society, are loudly called upon to act as the guardians of public taste, as well as public virtue, in an important instance. They are called upon to oppose, with the whole weight of their influence, the irruption of those swarms of publications that are daily issuing from the banks of the Danube; which, like their ravaging predecessors of the darker ages, though with far other arms, are overrunning civil society. Those readers, whose purer taste has been formed on the correct models of the old classic school, see with indignation and astonishment, the Vandals once more overpowering the Greeks and Romans. They behold our minds, with a retrograde but rapid motion, hurried back to the region of "chaos and old night," by wild and misshapen superstitions; in which, with that consistency which forms so striking a feature of the new philosophy, those who deny the immortality of the soul are most eager to introduce the machinery of ghosts; and by terrific and unprincipled compositions, which unite the taste of the Goths with the morals of Bagshot. [The newspapers announce that Shiller's Tragedy of the Robbers, which inflamed the young nobility of Germany to enlist themselves into a band of highwaymen to rob in the forests of Bohemia, is now acting in England by persons of quality.]

The writings of the French infidels, were, some years ago, circulated in England with uncommon industry, and with some effect; but the good sense and good principles of the far greater part of our countrymen resisted the attack, and rose superior to the trial. Of the doctrines and principles here alluded to, the dreadful consequences, not only in the unhappy country where they originated and were almost universally adopted, but in every part of Europe, where they have been received, have been such as to serve as a beacon to surrounding nations, if any warning can preserve them from destruction. In this country, the subject is now so well understood, that every thing which issues from the French press is received with jealousy; and a work, on the first appearance of its exhibiting the doctrines of Voltaire and his associates, is rejected with indignation.

But let us not, on account of this victory, repose in confident security. The modern apostles of infidelity and immorality, little less indefatigable in dispersing their pernicious doctrines than the first apostles were in propagating gospel truths, have only changed their weapons, but they have by no means desisted from the attack. To destroy the principles of Christianity in this island, appears at the present moment to be their grand aim. Deprived of the as-

stance

assistance of the French press, they are now attempting to attain their object under the close and more artificial veil of German literature. Conscious that religion and morals will stand or fall together, their attacks are sometimes levelled against the one, and sometimes against the other. With occasional strong professions of attachment to both of them, the feelings and the passions of the reader are engaged on the side of some one particular vice, or some one objection to revealed religion. Poetry as well as prose, romance as well as history; writings on philosophical as well as political subjects, have been thus employed to insil the principles of Illuminatism, while incredible pains have been taken to obtain able translations of every book, which it was supposed could be of use in corrupting the heart, or misleading the understanding. In many of these translations, the stronger passages, which, though well received in Germany, would have excited disgust in England, are wholly omitted, in order that the mind may be more certainly, though more slowly, prepared for the full effect of the poison at another period.

Let not those to whom these pages are addressed deceive themselves, by supposing this to be a fable; but let them enquire most seriously whether I speak the truth, when I assert that the attacks of infidelity in Great Britain are at this moment principally directed against the female breast. Conscious of the influence of women in civil society, conscious of the effect which female infidelity produced in France, they attribute the ill-success of their attempts in this country to their having been hitherto chiefly addressed to the male sex. They are now sedulously labouring to destroy the religious principles of women, and in too many instances they have fatally succeeded. For this purpose, not only novels and romances have been made the vehicles of vice and infidelity, but the same allurements have been held out to the women of our country, which was employed by the original tempter—Knowledge. Listen to the precepts of the new German enlighteners, and you need no longer remain in that situation in which Providence has placed you! Follow their examples, and you shall be permitted to indulge in all those gratifications which custom, not religion, has too far overlooked in the male sex.

We have hitherto spoken only of the German writings; but, as there are multitudes who never read, equal pains have been taken to promote the same object through the medium of the stage; and this weapon is, of all others, that against which it is at the present moment the most important to warn my countrywomen. As a specimen of the German drama, it may not be unseasonable to offer a few remarks on the admired play of the Stranger. In this piece, the character of an *adulteress*, which, in all periods of the world, ancient as well as modern, in all countries, heathen as well as Christian, has hitherto been held in detestation, and has never been introduced but to be reprobated, is, for the first time, presented to our view in the most pleasing and fascinating colours. The heroine is a woman who forsook a husband, the most affectionate and the most amiable, and lived for some time in the most criminal commerce with her seducer. Repenting at length of her crime, she buries herself in retirement. The talents of the poet, during the whole piece, are exerted in attempting to render this woman the object, not only of the compassion and forgiveness, but of the esteem and affection, of the audience.

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The injured husband, convinced of his wife's repentance, forms a resolution, which every man of true feeling and Christian piety will probably approve. He forgives her offence, and promises her through his life his advice, protection, and fortune, together with every thing which can alleviate the misery of her situation; but refuses to place her in the situation of his wife. But this is not sufficient for the German author. His efforts are employed, and it is to be feared but too successfully, in making the audience consider the husband as an unrelenting savage, while they are led by the art of the poet, anxiously to wish to see an adulteress restored to that rank of women, who have not violated the most solemn covenant that can be made with man, nor disobeyed one of the most positive laws which has been enjoined by God.

About the same time that this first attempt at representing an adulteress in an exemplary light was made by a German dramatist, which forms an era in manners; a direct vindication of adultery was for the first time attempted by a *woman*, a professed admirer and imitator of the German suicide Werter. The Female Werter, as she is styled by her biographer, asserts in a work, entitled "*The Wrongs of Woman*," that adultery is justifiable, and that the restrictions placed on it by the laws of England constitute part of the *wrongs of woman*.

But let us take comfort. These fervid pictures are not yet generally realised. These atrocious principles are not yet adopted into common practice. Though corruptions seem to be pouring in upon us from every quarter, yet there is still left among us a discriminating judgment. Clear and strongly marked distinctions between right and wrong still subsist. While we continue to cherish this sanity of mind, the case is not desperate.

Though the crime above alluded to, the growth of which always exhibits the most irrefragable proof of the dissoluteness of public manners; though this crime, which cuts up order and virtue by the roots, and violates the sanctity of vows, is awfully increasing, yet, thanks to the surviving efficacy of a holy religion, to the operations of virtuous laws, and the energy and unshaken integrity with which these laws are now administered; and still more perhaps to a standard of morals which continues in force, when the principles which sanctioned it are no more; this crime, in the female sex at least, is still held in just abhorrence: if it be practised, it is not honourable; if it be committed, it is not justified; we do not yet affect to palliate its turpitude; as yet it hides its abhorred head in lurking privacy; and reprobation hitherto follows its publicity.

"To every thing there is a season, and a time for every purpose under heaven;" said the wise man; but he said it before the invention of baby-balls. This modern device is a sort of triple conspiracy against the innocence, the health, and the happiness, of children; thus, by fascitious amusements, to rob them of a relish for the simple joys, the unbought delights, which naturally belong to their blooming season, is like blotting out spring from the year. To sacrifice the true and proper enjoyments of sprightly and happy children, is to make them pay a dear and disproportionate price for their artificial pleasures. They step at once from the nursery to the ball-room, and, by a preposterous change of habits, are thinking of dressing themselves, at an age when they used to be dressing their dolls.

dolls. Instead of bounding with the unrestrained freedom of little wood-nymphs over hill and dale, their cheeks flushed with health and their hearts overflowing with happiness, these *gay* little creatures are shut up all the morning, demurely practising the *pas grave*, and transacting the serious business of acquiring a new step for the evening, with more cost of time and pains than it would have taken them to acquire twenty new ideas.

Thus they lose the amusements which naturally belong to their smiling period, and unnaturally anticipate those pleasures (such as they are) which would come in, too much of course, on their introduction into fashionable life. The true pleasures of childhood are cheap and natural; for every object teems with delight to eyes and hearts new to the enjoyment of life: nay, the hearts of healthy children abound with a general disposition to mirth and joyfulness, even without a specific object to excite it; like our first parent, in the world's first spring, when all was new, and fresh, and gay, about him. Only furnish them with a few simple and harmless materials, and a little, but not too much, leisure, and they will manufacture their own pleasures with more skill, and success, and satisfaction, than they will receive from all that your money can purchase. Their bodily recreations should be such as will promote their health, quicken their activity, enliven their spirits, whet their ingenuity, and qualify them for their mental work. But, if you begin thus early to create wants, to invent gratifications, to multiply desires, to waken dormant sensibilities, to stir up hidden fires, you are studiously laying up for your children a store of premature caprice, and irritability and discontent.

While childhood preserves its native simplicity, every little change is interesting, every gratification is a luxury; a ride or a walk will be a delightful amusement to a child in her natural state; but, it will be dull and tasteless to a sophisticated little creature, nursed in these forced, and costly, and vapid, pleasures. Alas! that we should throw away this first grand opportunity of working into a practical habit, the moral of this important truth, That the chief source of human discontent is to be looked for, not in our real but in our factitious wants; not in the demands of nature, but in the artificial cravings of desire!

When one sees the growing zeal to crowd the midnight ball with these pretty fairies, one would be almost tempted to fancy it was a kind of pious emulation among the mothers to cure their infants of a fondness for vain and foolish pleasures, by tiring them out by this premature familiarity with them; and, that they were actuated by something of the same principle, which led the Spartans to introduce their sons to scenes of riot, that they might conceive an early disgust at vice: or possibly, that they imitated those Scythian mothers who used to plunge their new-born infants into the flood, thinking none to be worth saving who could not stand this early struggle for their lives: the greater part indeed, as it might have been expected, perished; but the parents took comfort, that, if many were lost, the few who escaped would be the stronger for having been thus exposed.

To behold lilliputian coquettes projecting dresses, studying colours, assorting ribbands and feathers, their little hearts beating with hopes about partners, and fears about rivals; and to see their fresh cheeks pale after the midnight supper, their aching heads and un-

braced nerves disqualifying the little languid beings for the next day's task, and to hear the grave apology, "that it is owing to the wine, the crowd, the heated room of the last night's ball;" all this, I say, would really be as ludicrous, if the mischief of the thing did not take off from the merriment of it, as any of the ridiculous and preposterous disproportions in the diverting travels of Captain Lemuel Gulliver.

Under a just impression of the evils which we are sustaining from the principles and the practices of *modern France*, we are apt to lose sight of those deep and lasting mischiefs which so long, so regularly, and so systematically, we have been importing from the same country, though in another form and under another government. In one respect, indeed, the first were the more formidable, because we embraced the ruin without suspecting it; while we defeat the malignity of the latter, by detecting the turpitude, and defending ourselves against it. This is not the place to descant on that levity of manners, that contempt of the sabbath, that familiarity with loose principles, and those relaxed notions of conjugal fidelity, which have often been transplanted into this country by women of fashion as a too common effect of a long residence in that: but it is peculiarly suitable to my subject, to advert to another domestic mischief derived from the same foreign extraction: I mean, the risks that have been run, and the sacrifices which have been made, in order to furnish our young ladies with the means of acquiring the French language in the greatest possible purity. Perfection in this accomplishment has been so long established as the supreme object, so long considered as the predominant excellence, to which all other excellences must bow down, that it would be hopeless to attack a law which fashion has immutably decreed, and which has received the stamp of long prescription. We must therefore be contented with expressing a wish, that this indispensable perfection could have been attained at the expense of sacrifices less important.

It is with the greater regret I animadvert on this and some other prevailing practices, as they are errors into which the wise and respectable have, through want of consideration, or rather through want of firmness to resist the tyranny of fashion, sometimes fallen. It has not been unusual, when mothers of rank and reputation have been asked how they ventured to intrust their daughters to foreigners, of whose principles they knew nothing, except that they were Roman catholics, to answer, "That they had taken care to be secure on that subject, for that it had been stipulated that the question of religion should never be agitated between the teacher and the pupil." This, it must be confessed, is a most desperate remedy; it is like starving to death to avoid being poisoned. And one cannot help trembling for the event of that education, from which religion, as far as the governess is concerned, is thus formally and systematically excluded. Surely, it would not be exacting too much, to suggest, at least, that an attention no less scrupulous should be exerted to insure the character of our children's instructor for piety and knowledge, than is thought necessary to ascertain that she has nothing *patois* in her dialect.

I would rate a correct pronunciation and an elegant phraseology at their just price, and I would not rate them low; but I would not offer up principle as a victim to sounds and accents. And the
matter

matter is now made more easy ; for whatever disgrace it might once have brought on an English lady, to have had it suspected from her accent that she had the misfortune not to be born in a neighbouring country ; some recent events may serve to reconcile her to the suspicion of having been bred in her own : a country, to which (with all its faults, which are many !) the whole world is looking up with envy and admiration, as the seat of true glory and of comparative happiness : a country, in which the exile, driven out by the crimes of his own, finds a home ! a country, to obtain the protection of which it was claim enough to be unfortunate ; and no impediment to have been the subject of her direct foe ! a country, which in this respect, humbly imitating the Father of compassion, when it offered mercy to a suppliant enemy, never conditioned for merit, nor insisted on the virtues of the miserable as a preliminary to its own bounty.

“ Persons, having been accustomed from their cradles to learn words before they know the ideas for which they stand, usually continue to do so all their lives, never taking the pains to settle in their minds the determined ideas which belong to them. This want of a precise signification in their words, when they come to reason, *especially in moral matters*, is the cause of very obscure and uncertain notions. They use these undetermined words confidently, without much troubling their heads about a certain fixed meaning, whereby, besides the ease of it, they obtain this advantage, that, as in such discourse they are seldom in the right, so they are as seldom to be convinced that they are in the wrong, it being just the same to go about to draw those persons out of their mistakes, who have no settled notions, as to dispossess a vagrant of his habitation who has no settled abode. The chief end of language being to be understood, words serve not for that end when they do not excite in the hearer the same idea which they stand for in the mind of the speaker.”

I have chosen to shelter myself under the broad sanction of the great author here quoted (Locke), with a view to apply this rule in philology to a moral purpose ; for it applies to the veracity of conversation as much as to its correctness ; and as strongly recommends unequivocal and simple truth, as accurate and just expression. Scarcely any one perhaps has an adequate conception, how much clear and correct expressions favour the elucidation of truth ; and the side of truth is obviously on the side of morals ; it is in fact one and the same cause : and it is of course the same cause with that of religion also.

It is therefore no worthless part of education to study the precise meaning of words, and the appropriate signification of language. To this end, I know no better method than to accustom young persons very early to define common words and things, for, as definition seems to lie at the root of correctness, to be accustomed to define English words in English would improve the understanding more than barely to know what those words are called in French or Italian. Or rather one use of learning other languages is, because definition is often involved in etymology ; that is, since many English words take their derivation from foreign languages, they cannot be so accurately understood without some knowledge of those languages : but precision of any kind too seldom finds its way into the education of women.

It is perhaps going out of my province to observe, that it might be well if young *men* also, before they entered on the world, were to be furnished with correct definitions of certain words, the use of which is rather ambiguous. For instance; they should be provided with a good definition of the word *honour* in the fashionable sense, shewing what vices it includes, and what virtues it does not include: the term *good company*, which even the courtly Petronius of our days has defined as sometimes including not a few immoral and disreputable characters: *religion*, which, in the various senses assigned it by the world, sometimes means superstition, sometimes fanaticism, and sometimes a mere disposition to attend on any kind of form of worship: the word *goodness*, which is made to mean every thing that is not notoriously bad; and sometimes even that too, if what is notoriously bad be accompanied by good humour, pleasing manners; and a little alms-giving. By these means they would go forth armed against many of the false opinions, which through the abuse or ambiguous meaning of words pass so current in the world.

But to return to the youthful part of that sex which is the more immediate object of this little work. With correct definition they should also be taught to study the shades of words, and this not merely with a view to accuracy of expression, but to moral truth.

It may be thought ridiculous to assert, that morals have any connection with the purity of language, or that the precision of truth may be violated through defect of critical exactness in the three degrees of comparison: yet how frequently do we hear from the dealers in superlatives, of "most admirable, super-excellent, and quite perfect," people, who, to plain persons, not bred in the school of exaggeration, would appear mere common characters, not rising above the level of mediocrity! By this negligence in the just application of words, we shall be as much misled by these trope and figure ladies, when they degrade as when they panegyricize; for, to a plain and sober judgment, a tradesman may not be "the most good-for-nothing fellow that ever existed," merely because it was impossible for him to execute in an hour an order which required a week: a lady may not be "the most hideous fright the world ever saw," though the make of her gown may have been obsolete for a month: nor may one's young friend's father be "a monster of cruelty," tho' he may be a quiet gentleman who does not choose to live at watering-places, but likes to have his daughter stay at home with him in the country.

But, of all the parts of speech the interjection is the most abundantly in use with the hyperbolical fair ones. Would it could be added that these emphatical expletives (if I may make use of a contradictory term) were not sometimes tinged with prophaneness! Though I am persuaded that idle habit is more at the bottom of this deep offence than intended impiety, yet there is scarcely any error of youthful talk which wants severer castigation. And a habit of exclamation should be rejected by polished people as vulgar, even if it were not abhorred as profane.

The conversation of young females is also in danger of being overloaded with epithets. As in the warm season of youth hardly any thing is seen in the true point of vision, so hardly any thing is named in naked simplicity; and the very sensibility of the feelings is partly a cause of the extravagance of the expression. But here,

as in other points, the sacred writers, particularly of the New Testament, present us with the purest models: and its natural and unlaboured style of expression is perhaps not the meanest evidence of the truth of the Gospel. There is throughout the whole narratives, no overcharged character, no elaborate description, nothing studiously emphatical, as if truth of itself were weak, and wanted to be helped out. There is little panegyric, and less invective: none but on great, and awful, and justifiable, occasions. The authors record their own faults with the same honesty as if they were the faults of other men, and the faults of other men with as little amplification as if they were their own. There is perhaps no book in which adjectives are so sparingly used. A modest statement of the fact, with no colouring and little comment, is the example held out to us for correcting the exuberances of passion and of language, by that divine volume which furnishes us with the still more important rule of faith and standard of practice. Nor is the truth lowered by feebleness; for with all this plainness there is so much force, that a few simple touches and artless strokes of scripture character convey a stronger outline of the person delineated, than is sometimes given by the most elaborate portrait of more artificial historians.

If it be objected to this remark, that many parts of the sacred writings abound in a lofty, figurative, and even hyperbolical, style; this objection applies chiefly to the writings of the Old Testament, and to the prophetic and poetical parts of that. But this metaphorical and florid style is distinct from the inaccurate and overstrained expression we have been censuring; for that only is inaccuracy which leads to a false and inadequate conception in the reader or hearer. The lofty style of the eastern, and of other heroic poetry, does not so mislead; for the metaphor is understood to be a metaphor, and the imagery is understood to be ornamental. The style of the scriptures of the Old Testament, are not, it is true, plain in opposition to figurative, nor simple in opposition to florid; but it is plain and simple in the best sense: it raises no false idea: it gives an exact impression of the thing it means to convey: and its very tropes and figures, though bold, are never unnatural or affected. Even when it exaggerates, it does not misrepresent; if it be hyperbolical, it is so either in compliance with the genius of Oriental language, or in compliance with contemporary customs, or because the subject is one which will be most forcibly impressed by a bold figure. The loftiness of the expression deducts nothing from the truth of the circumstance, and animates the reader without misleading him.

ACCOUNT OF A SUBMARINE FOREST ON THE EAST COAST OF ENGLAND. By JOSEPH CORREA DE SERRA, LL. D. F. R. S. and A. S.—PUBLISHED in the PHILOSOPHICAL TRANSACTIONS of 1799.

IN geology, more perhaps than in any other branch of natural history, there exists a necessity of strictly separating the facts observed from the ideas which, in order to explain them, may occur to the mind of the observer. In the present state of the science, every well-ascertained fact increases our still narrow stock of real knowledge; when, on the contrary, the reasonings we are enabled to make

make are at best but ingenious guesses, which too often bias and mislead the judgment. I shall, therefore, endeavour in this paper to give, first, a mere description of the object unmixed with any systematical ideas, and shall afterwards offer such conjectures on its causes as seem to me to be fairly grounded on observation.

It was a common report in Lincolnshire, that a large extent of islets of moor situated along its coast, and visible only in the lowest ebbs of the year, was chiefly composed of decayed trees. The islets are marked in Mitchell's chart of that coast by the name of *clay huts*; and the village of Huttoft, opposite to which they principally lie, seems to have derived its name from them. In the month of September 1796 I went to Sutton, on the coast of Lincolnshire, in the company of the Right Hon. the President of the Royal Society, in order to examine their nature and extent. The 19th of the month, being the first day after the equinoctial full moon, when the lowest ebbs were to be expected, we went in a boat about half past twelve at noon, and soon set foot upon one of the largest islands then appearing. Its exposed surface was about thirty yards long, and twenty-five wide, when the tide was at the lowest. A great number of smaller islets were visible around us, chiefly to the eastward and southward; and the fishermen, whose authority in this point is very competent, say, that similar moors are to be found along the whole coast, from Skegness to Grimsby, particularly off Addlethorpe and Mablethorpe. The channels dividing the islets were, at the time we saw them, wide, and of various depths; the islands themselves ranging generally from east to west in their largest dimensions.

We visited them again in the ebbs of the 20th and 21st; and, though it did not generally ebb so far as we expected, we could notwithstanding ascertain that they consisted almost entirely of roots, trunks, branches and leaves of trees and shrubs, intermixed with some leaves of aquatic plants. The remains of some of these trees were still standing on their roots, while the trunks of the great part lay scattered on the ground in every possible direction. The barks of trees and roots appeared generally as fresh as when they were growing; in that of the branches particularly, of which a great quantity was found, even the thin silver membranes of the outer skin were discernible. The timber of all kinds, on the contrary, was decomposed, and soft in the greatest part of the trees: in some, however, it was firm, especially in the roots. The people of the country have often found among them very sound pieces of timber, fit to be employed for several economical purposes.

The sorts of wood which are still distinguishable, are, birch, fir, and oak. Other woods evidently exist in these islets, of some of which we found the leaves in the soil; but our present knowledge of the comparative anatomy of timber is not so far advanced as to afford us the means of pronouncing with confidence respecting their species. In general the trunks, branches, and roots, of the decayed trees were considerably flattened; which is a phenomenon observed in the *furtastrand*, or fossil wood of Iceland, and which Scheuchzer remarked also in the fossil wood found in the neighbourhood of the lake of Thun in Switzerland.

The soil to which the trees are affixed, and in which they grew, is a soft greasy clay; but for many inches above its surface, the soil is composed of rotten leaves scarcely distinguishable to the eye, many

of which may be separated by putting the soil in water, and dexterously and patiently using a spatula or blunt knife. By this method I obtained some perfect leaves of *Ilex aquifolium*, which are now in the herbarium of the Right Honourable Sir Joseph Banks; and some other leaves, which, though less perfect, seem to belong to some species of willow. In this stratum of rotten leaves we could also distinguish some roots of *Arundo phragmites*.

These islets, according to the most accurate information, extend at least twelve miles in length, and about a mile in breadth, opposite to Sutton shore. The water without them, towards the sea, generally deepens suddenly, so as to form a steep bank. The channels between the several islets, when the islets are dry, in the lowest ebbs of the year, are from four to twelve feet deep: their bottoms are clay or sand, and their direction is generally from east to west.

A well, dug at Sutton by Joshua Searby, shews that a moor of the same nature is found under ground in that part of the country at the depth of sixteen feet, consequently very nearly on the same level with that which constitutes the islets. The disposition of the strata was found to be nearly as follows: Clay, 16 feet; moor, similar to that of the islets, 3 to 4 ditto; soft moor, like the scowerings of a ditch bottom, mixed with shells and silt, 20 feet; marly clay, 1 foot; chalky rock, from 1 to 2 feet; clay, 31 yards; gravel and water; the water has a chalybeate taste. In order to ascertain the course of this subterraneous stratum of decayed vegetables, Sir Joseph Banks directed a boring to be made in the fields belonging to the Royal Society in the parish of Mablethorpe. Moor of a similar nature to that of Searby's well, and the islets, was found, very nearly on the same level, about four feet thick, and under a soft clay.

The whole appearance of the rotten vegetables, we observed, perfectly resembles, according to the remark of Sir Joseph Banks, the moor which, in Blankeney Fen and in other parts of the East Fen in Lincolnshire, is thrown up in the making of banks; barks, like those of the birch-tree, being there also abundantly found. The moor extends over all the Lincolnshire fens, and has been traced as far as Peterborough, more than sixty miles to the south of Sutton. On the north side, the moory islets, according to the fishermen, extend as far as Grimsby, situated on the south side of the Humber: and it is a remarkable circumstance, that in the large tracts of low land which lie on the south banks of that river, a little above its mouth, there is a subterraneous stratum of decayed trees and shrubs exactly like those we have observed at Sutton; particularly at Axolme isle, a tract of ten miles in length by five in breadth; and at Hatfield Chace, which comprehends one hundred and eighty thousand acres. Dugdale had long ago made this observation in the first of these places; and De la Pryme in the second. The roots are there, likewise, standing in the places where they grew: the trunks lie prostrate. The woods are of the same species as at Sutton. Roots of aquatic plants and reeds are likewise mixed with them; and they are covered by a stratum of some yards of soil, the thickness of which, though not ascertained with exactness by the above-mentioned observers, we may easily conceive to correspond with what covers the stratum of decayed wood at Sutton, by the circumstances of the roots being (according to Mr. Richardson's observations) only visible when the water is low, where a channel was cut, which has left them uncovered.

Little

Little doubt can be entertained of the moory islets of Sutton being a part of this extensive and subterraneous stratum, which, by some inroad of the sea, has there been stripped of its covering of soil. The identity of the levels; that of the species of trees; the roots of these affixed, in both, to the soil where they grew; and, above all, the flattened shape of the trunks, branches, and roots, found in the islets (which can only be accounted for by the heavy pressure of a superinduced stratum), are sufficient reasons for this opinion.

Such a wide-spread assemblage of vegetable ruins, lying almost in the same level, and that level generally under the common mark of low-water, must naturally strike the observer, and give birth to the following questions: 1. What is the epoch of this destruction? 2. By what agency was it effected?

In answer to these questions, I will venture to submit the following reflections: The fossil remains of vegetables hitherto dug up in so many parts of the globe, are, on a close inspection, found to belong to two different states of our planet. The parts of vegetation, and their impressions, found in mountains, of a cotaceous, schistous, or even sometimes of a calcareous, nature, are chiefly of plants now existing between the tropics, which could neither have grown in the latitudes in which they are dug up, nor have been carried and deposited there by any of the acting forces under the present constitution of nature. The formation, indeed, of the very mountains in which they are buried, and the nature and disposition of the materials which compose them, are such as we cannot account for by any actions and re-actions which in the actual state of things take place on the surface of the earth. We must necessarily recur to that period in the history of our planet, when the surface of the ocean was at least so much above its present level as to cover even the summits of those secondary mountains which contain the remains of tropical plants. The changes which these vegetables have suffered in their substance is almost total; they commonly retain only the external configuration of what they were. Such is the state in which they are found in England by Llwyd; in France by Jussieu; and in the Netherlands by Burtin; not to mention instances in more distant countries. Some of the impressions or remains of plants found in soils of this nature, which were, by the more ancient and enlightened oryctologists, supposed to belong to plants actually growing in temperate and cold climates, seem, on accurate investigation, to have been part of exotic vegetables. In fact, whether we suppose them to have grown near the spot where they are found, or to have been carried thither from different parts by the force of an impelling flood, it is equally difficult to conceive how organized beings, which, in order to live, require such a vast difference in temperature and in seasons, could live on the same spot, or how their remains could (from climates so widely distant) be brought together in the same place by one common dislocating cause. To this ancient order of fossil vegetables belong whatever retains a vegetable shape, found in or near coal mines, and (to judge from the places where they have been found) the greater part of the agatized woods. But from the species and present state of the trees, which are the subject of this memoir, and from the situation and nature of the soil in which they are found, it seems very clear that they do not belong to the primeval order of vegetable ruins.

The second order of fossil vegetables, comprehends those which are found in the strata of clay or sand; materials which are the result of slow depositions of the sea and of rivers, agents still at work under the present constitution of our planet. These vegetable remains are found in such flat countries as may be considered to be of a new formation. The vegetable organization still subsists, at least in part; and their vegetable substance has suffered a change only in colour, smell, or consistence; alterations which are produced by the development of their oily and bituminous parts, or by their natural progress towards rottenness. Such are the fossil vegetables found in Cornwall by Borlase; in Essex by Derham; in Yorkshire by De la Pryme and Richardson; and in foreign countries by other naturalists. These vegetables are found at different depths, some of them much below the present level of the sea, but in clayey or sandy strata (evidently belonging to modern formation); and have no doubt been carried from their original place, and deposited there by the force of great rivers or currents, as it has been observed with respect to the Mississippi. In many instances, however, these trees and shrubs are found standing on their roots, and generally in low or marshy places above, or very little below, the level of the sea.

To this last description of fossil vegetables the decayed trees here described certainly belong. They have not been transported by currents or rivers; but, though standing in their native soil, we cannot suppose the level in which they are found to be the same as that in which they grew. It would be impossible for any of these trees or shrubs to vegetate so near the sea, and below the common level of its water; the waves would cover such tracts of land, and hinder any vegetation. We cannot conceive that the surface of the ocean has ever been lower than it now is; on the contrary, we are led, by numberless phenomena, to believe that the level of the water in our globe is now below what it was in former periods: we must therefore conclude, that the forest here described grew in a level high enough to permit its vegetation; and that the force (whatever it was) which destroyed it, lowered the level of the ground where it stood.

There is a force of subsidence (particularly in soft ground), which, being a natural consequence of gravity slowly though perpetually operating, has its action sometimes quickened and rendered sudden by extraneous causes, for instance by earthquakes. The slow effects of this force of subsidence have been accurately remarked in many places: examples also of its sudden action are recorded in almost every history of great earthquakes. The shores of Alexandria, according to Dolomieu's observations, are a foot lower than they were in the time of the Ptolemies. Donati, in his Natural History of the Adriatic, has remarked, seemingly with great accuracy, the effects of this subsidence at Venice; at Pola in Istria; at Liss, Bua, Zara, and Dicio, on the coast of Dalmatia. In England, Borlase has given, in the Philosophical Transactions, a curious observation of a subsidence, of at least sixteen feet, in the ground between Sampson and Trefcaw islands in Scilly. The soft and low grounds between the towns of Thorne and Gowle in Yorkshire, a space of many miles, has so much subsided in latter times, that some old men of Thorne affirmed, "that, whereas they could before see little of the steeples (of Gowle), they now see the church-yard wall." The instances of similar subsidence, which might be mentioned, are innumerable.

The force of subsidence, suddenly acting by means of some earthquake, seems to me the most probable cause to which the usual submarine situation of the forest we are speaking of may be ascribed. It affords a simple easy explanation of the matter; its probability is supported by numberless instances of similar events; and it is not liable to the strong objections which exist against the hypothesis of the alternate depression and elevation of the level of the ocean; an opinion which, to be credible, requires the support of a great number of proofs less equivocal than those which have hitherto been urged in its favour, even by the genius of a Lavoisier.

The stratum of soil, sixteen feet thick, placed above the decayed trees, seems to remove the epoch of their sinking and destruction far beyond the reach of any historical knowledge. In Cæsar's time, the level of the North Sea appears to have been the same as in our days. He mentions the separation of the Wahal branch of the Rhine, and its junction to the Meuse; noticing the then existing distance from that junction to the sea, which agrees, according to d'Anville's inquiries, with the actual distance. Some of the Roman roads, constructed, according to the order of Augustus, under Agrippa's administration, leading to the maritime town of Belgium, still exist, and reach the present shore. The description which Roman authors have left us, of the coasts, ports, and mouth of rivers, on both sides of the north sea, agree in general with their present state; except in the places ravaged by the inroads of this sea, more apt, from its force, to destroy the surrounding countries than to increase them.

An exact resemblance exists between Maritime Flanders and the opposite coast of England, both in point of elevation above the sea, and of the internal structure and arrangement of the soils. On both sides, strata of clay, silt, and sand, (often mixed with decayed vegetables,) are found near the surface; and, in both, these superior materials cover a very deep stratum of blueish or dark-coloured clay, unmixed with extraneous bodies. On both sides they are the lowermost part of the soil, existing between two ridges of high lands, on their respective sides of the same narrow sea. These two countries are certainly coeval; and whatever proves that Maritime Flanders has been for many ages out of the sea, must, in my opinion, prove also that the forest we are speaking of was long before that time destroyed and buried under a stratum of soil. Now it seems proved from historical records, carefully collected by several learned members of the Brussels Academy, that no material change has happened to the lowermost part of Maritime Flanders during the period of the last two thousand years.

I am therefore inclined to suppose the original catastrophe which buried this forest to be of very ancient date; but I suspect the inroad of the sea, which uncovered the decayed trees of the islands of Sutton, to be comparatively recent. The state of the leaves and of the timber, and also the tradition of the neighbouring people, concur to strengthen this suspicion. Leaves, and other delicate parts of plants, though they may be long preserved in a subterraneous situation, cannot remain uninjured when exposed to the action of the waves and of the air. The people of the country believe that their parish-church once stood on the spot where the islets now are, and was submerged by the inroads of the sea, and that at low water their ancestors could even discover its ruins; and that their present church was built to supply

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supply the place of that which the waves washed away, and that even their present clock belonged to the old church. So many concomitant circumstances, though weak testimonies, incline me to believe their report; and to suppose that some of the stormy inundations of the North Sea, which in these last centuries have washed away such large tracts of land on its shores, took away a soil resting on clay, and at last uncovered the trees which are the subject of this paper.

OF THE COTTON MANUFACTURE IN LANCASHIRE.

COTTON, it is well known, is the produce of a shrub, in the warmer climates of the East and West Indies, and even in the more temperate countries which border the Levant. It comes to us without any farther preparation than having been carefully picked out of the pod in which it grows; but still much dirt, husk, and other impurities, remain in it. This is first separated by women, who beat the cotton with sticks upon hurdles, and pick out the more gross impurities with their fingers. It is then taken to the carding engine, where it is first scribbled, as the wool-carder would say, and afterwards, divided into perpetual cardings, which are caught by, and coiled round the sides of, long tin cylinders. These coils are taken to the mules, first to be roved, which answers to stubbing, and afterwards to be spun into threads of any requisite fineness. The invention of the mules forms quite an epoch in the history of the cotton trade. A vast improvement has been made, about thirty years ago, by the introduction of the spinning jennies, by which from twenty to forty spindles were turned at a time. Still, however, the rovings, or coarse half-twisted threads, partaking somewhat of the nature of cardings, though approaching in some degree to spun twist, were obliged to be prepared by the hand-wheel: The invention of mules entirely supplied this defect; and, while it enabled the spinner to prepare her rovings as fast as she before could spin, at the same time it put her in a way of performing her farther work much more expeditiously and completely. The machine is called a *mule*, either because it is a kind of machine which might easily be turned by a mule, or, more probably, because it is a sort of mongrel, partaking of the nature both of carding and spinning, or uniting together the action both of the roller and spindle. It consists of three sets of fluted brass rollers, the flutes of which turn into each other: the first set goes faster than the second, and the second faster than the third, between which, when the roll of carded cotton enters, it is a little lengthened out, still more by the second, and farther still by the first, after passing which, it is slightly twisted by the rapid circular motion on its axis, communicated by a leather band to a perpendicular tin cylinder, into which it falls. If the roving be not made thin enough by the first operation, it is made to undergo a repetition of it, and it is then carried to the spinning mules; which differ from the former only in this, that when the threads have passed the rollers, they are drawn out and twisted by a course of spindles, which are set in motion after a sufficient quantity of the roving has passed the rollers, which are themselves, at this time stopped. The advantage of this mode of preparing the threads is understood to be, that the fibres of the cotton are all laid longitudinally, and in as small a number as is wanted, before they are begun to be much twisted; by which means, threads

of any required fineness are made much stronger than they were from rovings prepared upon the spindle, which twisted them too much in the first instance; and, in the subsequent processes for rendering them finer, many of the fibres were necessarily broken. On one of these mules 240 threads are often spun at once, and two of them may be managed by one woman, with a child to each to tie the threads which may occasionally break. A large factory for these operations usually consists of a vast cellar to hold the raw materials, of a ground floor for the pickers and beaters; and, in the upper floors, first teasing and carding engines, then roving machines, afterwards mules, and lastly, machines for winding the thread or twist; the whole occupying a building of six or seven stories, and all moved, either by a large water-wheel or by a small fire-engine, which, if of Boulton and Watt's construction, occasions very little inconvenience to the neighbourhood, as it consumes nearly all its smoke.—For winding the thread regularly off the spindles upon bobbins, various contrivances are in use: none, however, appears more simple than a heart-shaped axis, which moves the bobbins to the right or left, according to the position of the apex or the base of the heart. Other portions of the thread are wound in quills for the shuttle; and others, again, are formed into hanks, some of which are tightly bound round at certain intervals, previous to their being dyed, in order to prevent the parts so tied from taking the colour. This is done, that the threads may be disposed in the warp, so as to produce the clouds which are seen in various species of the cotton goods, particularly gingams. The only colours which the cotton manufacturer has hitherto been able to render so permanent as to withstand the effect of bleaching, are, the Turkey-red, the dark blue, and the buff. A durable green would certainly make the fortune of any chemist who should discover it.

The warp being fixed in the loom, or, in the language of the country, gaited, is divided to give passage to the weft in the shuttle, either by two, three, or more, treddles; or, if the pattern, or course of changes in the order of raising and depressing the threads of the warp, be various, so that the weaver could not manage the requisite number of treddles, by a great number of strings which pass over pulleys above the loom, and are drawn one after another, by a little boy, above whose head they are orderly disposed in two rows, by the side of the looms. These looms are therefore called drawboys. These boys, however, will shortly be set aside for machinery, which is rapidly introducing as a substitute. For the formation of sprigs, &c. of various colours, there are often as many shuttles as colours; or a number of little swivel looms, such as they use for the weaving of tapes, are introduced occasionally, as many as there are sprigs in the breadth of the piece. Quiltings appear to be two distinct cloths; tied, as it were, together, by stitches which go through both cloths; and in some cases, as in bed-quilt, there is a third shuttle, which throws in a quantity of coarsely spun cotton, to serve as a kind of wadding. The counterpanes are woven with two shuttles, one containing a much coarser weft than the other; the coarser weft is thrown over at certain intervals, and the thread is picked up with an iron pin, rather hooked at the point, so as to form knobs disposed in a sort of pattern.

When the goods are come from the loom, most of the sorts of
them,

them, previously to their being bleached, are dressed or fired, by being drawn, and that not very quickly, over very red-hot cylinders of iron, by which the superfluous nap is burnt off. To see such an operation performed upon so combustible a substance, naturally fills a stranger with the utmost astonishment. They are then washed in a wheel with soap and water, and, having been well scoured with an alkaline lixivium, are dipped in the oxygenated muriatic acid diluted to its proper strength. These operations are repeated alternately, till the goods have attained the requisite degree of whiteness; and between each dipping, they are laid out upon the ground, exposed to the action of the sun and air. When completely bleached, they are either smoothed upon long tables, with smoothing irons, or calendered, that is, stretched and pressed between a course of rollers, by which they acquire a fine gloss. Callicoes are printed exactly in the same way as the kerseymeres in Yorkshire; but the works are usually upon a much larger scale. Thicksets, corduroys, velveteens, &c. are cut upon long tables, with a knife, of a construction somewhat like the sting of a wasp, terminating in a very sharp point, defended on each side by a sort of sheath. This point is introduced under the upper course of threads, which are intended to be cut, and with great ease carried forward the whole length of the table.

The rapid increase of the cotton trade appears to have been owing, in a great measure, to the more liberal introduction of machinery into every branch of it, than into any other of our staple manufactures. The utility and policy of employing machines, to shorten labour, has been a subject which has exercised the pens of several ingenious writers; while their introduction into almost every branch of manufacture has been attended, in the outset, with much riot and disorder. They are, undoubtedly, most wonderful productions of human genius, the progressive exertions of which, neither can nor ought to be stopped: they enable the manufacturer to produce a better article than can be made by the hand, in consequence of the uniformity and certainty of their operations; and at a much lower price, in consequence of the vast quantities of work they are capable of performing. They thus support the credit of our manufactures abroad; and enable us, under the vast load of taxes, and consequent increase in the price of every necessary of life, to meet our foreign competitors with advantage at market. They can even allow the goods to furnish, in their passage, a considerable revenue to the government. And although they do, undoubtedly, on their first introduction, throw some persons out of employ, by changing the nature and course of business, they almost immediately make up for the inconvenience by astonishingly multiplying the absolute quantity of employment. If they take away their work from carders and spinners, they return it them back tenfold as winders, warpers, weavers, dressers, dyers, bleachers, printers, &c. &c.

On the other hand, may it not be a subject of reasonable apprehension, whether our manufactures may not be much more easily and speedily removed into foreign countries, by the transplantation of our machines, than of our workmen? They have no prejudices to conquer, no relations or friends to leave, no old habits to break, no new language to learn, no rooted attachment to their native soil. They are at once naturalized in any country, and will enable the inhabitants of any country, that can procure them, immediately to rival

val those in which they were originally produced. But this is a consideration for the inhabitant of a particular country : the moralist, and the friend of mankind, will be more affected by such considerations as the following :

It is greatly to be feared, that whoever, unbiassed by interest or prejudice, and under the influence of no motives but a regard to the welfare of his fellow-creatures, examines these establishments, will be strongly inclined to doubt whether they are, upon the whole, of real advantage to the bulk of the persons employed in them, and, of course, to society at large. It has been commonly, and I fear too justly, remarked, that wherever the labouring part of mankind have been collected in large bodies, they have always, more or less, corrupted each other; and, I am sure, it will not require any very acute talent for observation, to discover a sensible change in the manners of the people in the neighbourhood of these great factories. But, it is not this circumstance merely, connected with these establishments, of which the friends to the improvement of their species have just cause to complain. An ingenious division has sometimes been made of the day, into three parts, one for labour; one for meals and recreation, and one for rest; and also of the life, into one for learning, one for working, and one for enjoyment and repose. Nothing like either of these propositions is at all attended to here. I know, it has usually been boasted of, as a great advantage to these machines, that they encourage population, by rendering children valuable to their parents at an early period of their lives. I confess, that I am of a different opinion. Childhood and youth are the proper season for encouraging both the body and the mind to unfold themselves; the one by air and active exercise; the other, by allowing it leisure for observation, and by assisting it with such instruction as is suited to the particular capacity and station in life. But when children are set to work almost as soon as they can walk; when, from six years of age, they are confined in close rooms ten hours in the day, to give notice of the breaking of a thread; what must become of those bodily powers, which, at this important period of life, ought to be kept in full play? how should those intelligent faculties expand which are confined to such minute objects? or what moral structure can be expected, should be built on such foundations; where nothing is heard in conversation between those of the same sex, but profaneness, and between those of a different, but obscenity? So that the real state of the case appears rather to be this; that parents are tempted to defraud their children of the exercise necessary to their health, of the education necessary to their usefulness, and of their morals by evil company, in order to secure for themselves, as the price of these sacrifices, some paltry fourpence or sixpence a day; which is, besides, very frequently perverted into the means of their own increased intemperance. If this be true, population is discouraged by these machines, both among the old and the young.

But this is not all: where parents are employed along with their children, it is possible, may we not say probable, that natural affection, and a regard to their own interest, will induce them still to pay some attention to the behaviour of their children; and that the hope of their improvement, or the dread of being chargeable with having contributed to corrupt them, will also have some effect as a check upon their own conduct.

But

But what shall we say of those establishments which hire, by wholesale, for a term of years, the pauper-children of a distant parish, and thus break all the ties of parental and filial affections, and destroy all the motives to a virtuous conduct, which they may be expected to suggest? When the owners of a great factory take three hundred children from the overseers of St. Giles's, and bring them down in covered waggons, never to see, or hear of, or care for, their parents more; what can we call such vehicles, but slave-vessels upon wheels; or what such factories, but what I heard one of them emphatically called, a receptacle for *white negroes*?

In many cases, indeed, the children are well lodged and fed, and, in some cases, taught; but then, the school-hours are robbed from the hours of recreation, and not from those of labour; and, when children have been worked from six to six, with the only necessary intermission of meals, few persons, I suppose, will question, whether the interval between work and bed-time would be better employed in the school or in the play-field.

Further, the object of their engagement is to attend to the business of the factory; that is, to superintend the regular progress of a series of operations, produced by machinery, such as the tying of broken threads, the serving of cardings, rovings, and twist, to the different parts of the machine. Not one of these things fit them for afterwards supporting themselves; so that when the time of their emancipation is arrived, and they are turned adrift, to have their places supplied by another succession of children, who can be paid and fed at a smaller charge, the only resource for the men, is the army; for the women, the wretched and pitiable trade of prostitution.

There is still another evil consequence of these establishments, which, though perhaps of less importance, has made more noise, because people are too commonly most affected by what may affect themselves. It has been found, that the work is better performed the less air is admitted into the factory; the circulation of fresh air is, therefore, too much discouraged, and of course the seeds of contagion are accumulated. In some instances, too, the works have been kept going day and night; and the two sets have succeeded each other in the unventilated rooms of the one, and the yet warm beds of the other, till something very like plague has been repeatedly generated. Those who wish to see this matter set in its true light, may consult Sir William Clerke's *Thoughts on Contagion*, the Reports of the Manchester Physicians, and Regulations and Orders of the Magistrates at the Manchester Quarter-sessions.

I trust I shall not be suspected of any thing so absurd, as the wish to check the progress of mechanical improvements, or to say to the inventive powers of the mind, "hitherto shall ye go, but no farther." Whenever any state has acted on so wild a principle, the only effect has been to drive restrained genius to take refuge in another, which has received the benefit with open arms, and laughed at the folly of its rival. Nor do I, by any means, wish to be understood, as applying the above observations to every establishment of this nature. If all their owners paid such attention to the comfort, health, and improvement, of those whom they employ, as the benevolent Mr. Dale, of Lanark, there would be less occasion for either public or private animadversion; but as this, it is to be feared, is not soon likely to be the case, it appears to me, that these large factories are very

very fair objects of legislative regulation. For every state is bound to take care, that even genius itself shall not so use its own, as to injure that of another; and that it is in an especial manner bound to protect the poor from being abused or corrupted by the rich leaders either of the landed or commercial aristocracy: to the introduction of which latter class, I look upon these establishments to have been eminently instrumental.

ACCOUNT OF CALVIN PHILIPS, THE AMERICAN DWARF.

A REMARKABLE dwarf has lately been exhibited at New York. At the age of eight his height was twenty-six inches and a half, and his weight twelve pounds, including his clothes.

This phenomenon was born at Bridgewater, in the state of Massachusetts, on the 14th of January 1791. His father, who is about the middle size, was twenty-four years of age when the child was born; and his mother, rather above the ordinary size, was twenty-six, both sound and healthy. They have had five other children, two before and three since the birth of the dwarf, all of them healthy, and of the usual size. All the circumstances of gestation and parturition in the case of this dwarf were natural: he was so small at his birth as scarcely to weigh two pounds; his thigh was not thicker than a man's thumb, and all the other parts of his body were in proportion. His mother, who is a poor woman, used to carry him in her bosom while she was spinning.

Notwithstanding his diminutiveness, this child was extremely healthy, had a good appetite, was exempt from all the diseases of infancy, except the whooping cough, which was very favourable, and some trouble from worms: he was weaned at seven months, began to creep at nine months, and to walk at eighteen months, but he did not begin to speak till he was four years of age. He got his first teeth at ten or eleven months without pain or difficulty, and has since had the common number, two of which are already shed.

From his birth, till two years old, he grew very slowly, afterwards more perceptibly till five, and since that period has altogether ceased to grow, which is ascertained both by his weight, and by the size of his clothes worn three years ago.

Since he was weaned he has always been fed upon the common articles of diet given to children; he eats moderately but sufficiently, and is particularly fond of fruits and cyder, but has never drunk any distilled liquor. He sleeps in an easy and natural manner, generally goes to bed about seven o'clock, and reposes till four or five in the morning, but never sleeps in the day-time. He is active, playful, sprightly, and very irascible, and is commonly occupied in the sports of children, to which he is devoted in a remarkable degree.

On inspection of his body undressed, no deformity or deficiency appears; on the contrary, he is every way formed with the greatest symmetry. His figure displays a pleasing and elegant proportion, and his face, though thin and long, is made of regular and agreeable features, corresponding to his age rather than size, and indicating a degree of maturity, in point of evolution, much beyond his years. His complexion and hair are light, his eyes blue, and his general aspect is delicate. The palms of his hands and soles of his feet have
acquired

acquired much of the hardness, and the former are a good deal marked with the lines belonging to maturer age. His voice is shrill, and less articulate than is common at his period of life. He is rather reserved to strangers, much displeased with the inspection of visitors, and already appears to shew some signs of sexual propensity.

His mental attainments appear to fall rather short of the ordinary standard at his age: he has only learned a few letters of the alphabet; but his situation, in a variety of respects, has been unfavourable to improvement; and it is to be wished that proper attention may be paid to the cultivation of his understanding, in order to ascertain the comparative powers of his mind.

In his travels, as a public spectacle, this dwarf is under the charge of his maternal grandfather and grandmother. The former is a large and robust man aged fifty-six, and the latter is about the middle size and aged fifty-four. They are both in good health, and have been so generally throughout their lives. They say that the boy never suffered any injury by blows, falls, or other accidents, whether before or after his birth, and that they are unacquainted with any cause to which his diminutive size may be ascribed.

DISEASES OF MINERS, AND PERILS OF MINING.

THE employments of miners are unwholesome, and very seldom allow them to reach their grand climacteric. Their appearance, indeed, denotes an imperfect state of health, it being commonly pale, wan, and weakly; not that they are subject to any particular complaint (except one); but being perpetually in the wet, and experiencing quick and constant transitions from heat to cold, they gradually undermine their constitutions, and fall early victims to the diseases generally produced by this inattention.

The disorder which forms the exception just-mentioned, is called by the patients *ballan*, and seems peculiar to the lead mines. It is a constipation of the bowels (produced by their imbibing into the stomach particles of lead) of uncertain duration, but attended with acute and intolerable pain. The poor wretch, groaning under this affliction, has frequently been known to continue fourteen days without an evacuation, and when, at length, released, to have discharged with his urine and fæces small masses of the pernicious mineral. Perhaps, however, the unhealthy appearance of the miners may in some degree be occasioned by their free use of spirituous liquors, to which they are fatally attached. Smoking, also, is a most favourite practice with them; and, carried to the extreme in which they indulge it, may assist in weakening and debilitating them. The passion, indeed, extends in all its force to the children of these people; and boys of ten or twelve years old are perpetually seen with short pipes, about two inches long, stuck in their mouths, and breathing, like Chimæras, smoke and flame from morning to night. The number of workmen, including colliers, employed in the different mines around Holywell, are about seven hundred.

Perilous as the business of mining appears to be, one naturally expects to hear of frequent accidents among the workmen. Habit, however, renders them so expert, that *serious* casualties seldom occur. Some "hair-breadth 'scapes," indeed, are on record, which, had they not been told us by those whose veracity is unquestionable,

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we should not have very hastily given credit to. Of these the following are the most remarkable:

A few years since, a workman fell down the shafts of a mine in the neighbourhood of Holywell, nearly one hundred and twenty feet deep, and was so little incommoded by the sudden descent, as to exclaim to his companions above, who were anticipating his immediate death, "Ecod, I've broke my clogs."

A coachman of Mr. Pennant, also, fell down a coal-pit, with similar good fortune.

These, however, were nothing, when compared to the adventure of a man now living at Whiteford, near Holywell, who, when a lad, had tumbled into one of these mines, of three hundred feet, and escaped alive.

Not more than two or three years since, the roof of a neighbouring mine gave way so suddenly, that a poor workman, not having time to escape, was instantly overwhelmed with the foundering earth. Standing fortunately at this time under a mass of rock, he escaped being immediately crushed to death; but, as there were many thousand tons of earth above him, the melancholy prospect of certain destruction, by means the most lingering and terrible, still presented itself to him. When the accident happened, he had half a pound of candles in his hand, and upon this, and the trickling water that distilled through the cracks of the rock, he subsisted nine days, until his faithful companions, who, with an anxious solicitude that does honour to humanity, worked incessantly (spell and spell) for nine days and as many nights, at length reached and liberated him from the horrible prison in which he was immured.

A singular instance of providential preservation occurred also in a coal-mine at Mostyn-park, a few miles from the scene of the last wonder. As twelve men were following their employment in the dark recesses of the mountain, the water suddenly burst in, and in a few minutes must have overwhelmed them all. The rope, however, by which the bucket is drawn up, happened to be hanging down at this critical moment, and the whole party, clinging to it, hallooed lustily to their companions above to pull them up. Their cries were heard, and the people immediately wound up the rope, which brought them safely to the top, though it had that very day been condemned as too old and unsafe to be longer used.

ACCOUNT OF A BANIAN-TREE IN THE PROVINCE OF BAHAR.—By COLONEL IRONSIDE.

NEAR Manjee, a small town at the confluence of the Devah (or Gogra) and the Ganges, about twenty miles west of the city of Patna, there is a remarkably large tree, called a *bur* or *banian-tree*, which has the quality of extending its branches, in a horizontal direction, to a considerable distance from its stem; and of then dropping leafless fibres, or scions, to the ground, which there catch hold of the earth, take root, embody, grow thick, and serve either to support the protracted branches, or, by a farther vegetation, to compose a second trunk. From these branches other arms again spring out, fall down, enter the ground, grow up again, and constitute a third stem, and so on. From the opposite pretty high bank

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of the Ganges, and at the distance of near eight miles, we perceived this tree of a pyramidical shape, with an easy spreading slope from its summit to the extremity of its lower branches, and mistook it at first for a small hill: we had no quadrant to measure its height; but the middle or principal stem is considerably higher, I think, than the highest elm, or other tree, I ever saw in England. The following comprise some other of its dimensions, which were taken with a cord of a given length:—

	Yards.	Feet.
Diameter of the branches from north to south	121, or	363
Diameter of ditto from east to west	125, or	375
Circumference of the shadow of the extreme branches, taken at the meridian	372, or	1116
Circumference of the several bodies or stems, taken by carrying the cord round the outermost trunks	307, or	921
The several trunks may amount to fifty or sixty.		

N. B. The dropping fibres shoot down from the knots or joints of the boughs.

This tree, as well as the *peepel*, and many other large trees in India, is a creeper. It is often seen to spring round other trees, particularly round every species of the palm. The date, or palmyra, growing through the centre of a banian-tree, looks extremely grand; and yet none of the European landscape painters, who have delineated views of this country, have introduced this characteristic object into their pieces. I have frequently observed it also shooting from old walls, and running along them. In the inside of a large brick-wall it lined the whole circumference of the internal space of it, and thus actually became a tree turned inside out.

Under the tree sat a *fakir*, or devotee. He had been there twenty-five years; but he did not continue under the tree throughout the year, his vow obliging him to lie, during the four coldest months, up to his neck in the Ganges; and to sit, during the four hottest months, close to a large fire.

OF JUGGLERS; OR THE ARTS OF DECEPTION.

JUGGLERS will never want encouragement and support, while they exhibit with confidence any thing uncommon, and know how to suit the nature of their amusements to the taste of the spectators. The greater part of mankind love deception so much, that they reward liberally those who impose on their senses, as is proved by the ready sale of gilt articles, artificial gems, and a thousand other things which are not in reality what they appear to be. We do not know whether Montagne is right in considering it as a sign of the weakness of our judgment, that we take a pleasure in beholding objects on account of their rarity, novelty, or the difficulty that attends them, though they may be subservient to no useful purpose. This appears to proceed from that innate curiosity which serves as a spur to incite us to enlarge our knowledge, and to engage in researches and undertakings that often lead to discoveries of greater importance.

Jugglers, indeed, seldom exhibit any thing that can appear wonderful to those acquainted with natural philosophy and mathematics; but these even often find satisfaction in seeing truths already known to them applied in a new manner; and they readily embrace every

opportunity of having them farther illustrated by experiments. Many, however, are too precipitate, and attempt to explain before they have sufficiently examined, of which the golden tooth at the end of the sixteenth century, the conjuring-rod at the end of the seventeenth, and the chess-player and speaking-machine at the end of the present, may serve as instances. But it often happens, that what ignorant persons first employ, merely as a show, for amusement or deception, is afterwards ennobled by being applied to a more important purpose. The machine with which a Savoyard, by means of shadows, amused children and the populace, was by Liberkünig converted into a solar microscope ; and, to give one example more, which may convince female readers, the art of making ice in summer, or in a heated oven, enables guests, much to the credit of their hosts, to cool the most expensive dishes. The Indian discovers precious stones ; and the European, by polishing, gives them a lustre.

But, if the arts of jugglers served no other end than to amuse the most ignorant of our citizens, it is proper that they should be encouraged for the sake of those who cannot enjoy the more expensive deceptions of an opera. They answer other purposes, however, than that of merely amusing : they convey instruction in the most acceptable manner, and serve as an agreeable antidote to superstition, and to that popular belief in miracles, exorcism, conjuration, sorcery, and witchcraft, from which our ancestors suffered so severely. Wherever the vulgar were astonished at the effects of shadows, electricity, mirrors, and the magnet, interested persons endeavoured by these to frighten them ; and thus misapplied the powers of nature to promote their own advantage. The pontiffs and their clergy ought, undoubtedly, to be detested for discouraging experimental philosophy. That science they considered as a formidable enemy ; and they thought they gained no small advantage when they induced the house of Medici, by granting it the cardinalship, to suppress the Academy del Cimento. When Gasner exhibited his deceptions, some one proposed to him to try his art at Berlin or Gottingen, and to drive out there if it were only the smallest of all the devils ; but he else cities were not theatres where he was likely to succeed, and he never ventured to appear in them. The juggler, mentioned in Xenophon, requested the gods to allow him to remain only in places where there was much money, and abundance of simpletons. It is, however, better that the populace, if they will absolutely pay for being deceived, should be exposed to a momentary deception from jugglers than to a continual deception from priests. As the former are not covered with the sacred cloak of religion, their deceptions are more easily seen through and detected ; and they consequently soon cease to be hurtful. So late as the year 1601, a horse, which had been taught to perform a number of tricks, was tried, as possessed by the devil, and condemned to be burnt. This horse was seen in the above-mentioned year by Casaubon, to whom the owner, an Englishman, discovered the whole art by which he had been trained. At present such horses are so often exhibited publicly in the heretical countries of Europe, that the Spanish inquisition, perhaps, will soon be ashamed of considering such a proof of the docility of these animals, and of the patient dexterity of their teachers, as the work of the devil, as they did in the beginning of this century.

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Had that book which Celsus wrote against the Magi been preserved, we should have been much better acquainted with the art of the ancient conjurors or jugglers. This Celsus, without doubt, is the same author whose virulent attack against the Christians was refuted by Origen; and we have, therefore, greater cause to regret that a work on the above subject, by so learned and acute a philosopher, should have been lost. He is mentioned with respect by Lucian, and even by Origen; and the former derived from him the account which he gives of Alexander the impostor. More ancient authors also wrote upon the same subject. Some of them are mentioned by Diogenes Laertius in his preface; and Suidas quotes the Magicon of Antisthenes, though neither of these speaks of Celsus; but of all those writings none are now extant.

The deception of breathing out flames, which excites, in a particular manner, the astonishment of the ignorant, is very ancient. When the slaves in Sicily, about a century and a half before our æra, made a formidable insurrection, and avenged themselves in a cruel manner for the severities which they had suffered, there was amongst them a Syrian named Eunus, a man of great craft and courage, who, having passed through many scenes of life, had become acquainted with a variety of arts. He pretended to have immediate communication with the gods; was the oracle and leader of his fellow-slaves; and, as is usual on such occasions, confirmed his divine mission by miracles. When, heated by enthusiasm, he was desirous of inspiring his followers with courage, he breathed flames or sparks among them from his mouth while he was addressing them. We are told by historians, that for this purpose he pierced a nut-shell at both ends, and, having filled it with some burning substance, put it into his mouth and breathed through it. This deception, at present, is performed much better. The juggler rolls together some flax or hemp, so as to form a ball about the size of a walnut; sets it on fire; and suffers it to burn till it is nearly consumed; he then rolls round it, while burning, some more flax; and by these means the fire may be retained in it for a long time. When he wishes to exhibit, he slips the ball unperceived into his mouth and breathes through it: which again revives the fire, so that a number of weak sparks proceed from it; and the performer sustains no hurt, provided he inspire the air not through the mouth but the nostrils. By this art the Rabbi Bar-Cocheba, in the reign of the Emperor Adrian, made the credulous Jews believe that he was the hoped-for Messiah; and two centuries after, the Emperor Constantius was thrown into great terror, when Valentinian informed him that he had seen one of the body-guards breathing out fire and flames in the evening.

For deceptions with fire the ancients employed also naphtha, a liquid mineral oil, which kindles when it only approaches a flame. Galen informs us, that a person excited great astonishment by extinguishing a candle and again lighting it, without any other process than holding it immediately against a wall or a stone. The whole secret of this consisted in having previously rubbed over the wall or stone with sulphur. But as the author, a few lines before, speaks of a mixture of sulphur and naphtha, we have reason to think that he alludes to the same here. Plutarch relates how Alexander the Great was astonished and delighted with the secret effects of naphtha, which

which were exhibited to him at Ecbatana. The same author, as well as Pliny, Galen, and others, has already remarked, that the substance with which Medea destroyed Creusa, the daughter of Creon, was nothing else than this fine oil. She sent to the unfortunate princess a dress besmeared with it, which burst into flames as soon as she approached the fire of the altar. The blood of Nessus, in which the dress of Hercules, which took fire likewise, had been dipped, was undoubtedly naphtha also; and this oil must have been always employed when offerings caught fire in an imperceptible manner. In all periods of the world, priests have acted as jugglers to simple and ignorant people.

In modern times, persons who could walk over burning coals or red-hot iron, or who could hold them in their hands and their teeth, have often excited wonder. In the end of the last century, an Englishman, named Richardfon, who, as we are assured, could chew burning coals; pour melted lead upon his tongue; swallow melted glass, &c. rendered himself very famous by these extraordinary feats. Laying aside the deception practised on the spectators, the whole of this secret consists in rendering the skin of the soles of the feet and hands so callous and insensible, that the nerves under them are secured from all hurt, in the same manner as by shoes and gloves. Such callosity will be produced if the skin is continually compressed, singed, pricked, or injured in any other manner. Thus do the fingers of the industrious sempstresses become horny by being frequently pricked; and the case is the same with the hands of fire-workers, and the feet of those who walk bare-footed over scorching sand.

In the month of September, 1765, when I visited the copper-works at Awestad, one of the workmen, for a little drink-money, took some of the melted copper in his hand, and after shewing it to us, threw it against a wall. He then squeezed the fingers of his horny hand close to each other; put it a few minutes under his armpit, to make it sweat, as he said; and, taking it again out, drew it over a ladle filled with melted copper, some of which he skimmed off, and moved his hand backwards and forwards, very quickly, by way of ostentation. While I was viewing this performance, I remarked a smell like that of singed horn or leather, though his hand was not burnt. The workmen at the Swedish melting-houses shewed the same thing to some travellers in the last century; for Regnard saw it in 1681, at the copper-works in Lapland. It is highly probable that people who hold in their hands red-hot iron, or who walk upon it, as I saw done at Amsterdam, but at a distance, make their skin callous before, in the like manner. This may be accomplished by frequent moistening it with spirit of vitriol; according to some, the juice of certain plants will produce the same effect; and we are assured by others that the skin must be very frequently rubbed, for a long time, with oil, by which means, indeed, leather also will become horny.

Of this art traces may be found also in the works of the ancients. A festival was held annually on Mount Soracte, in Etruria, at which the Hirpi, who lived not far from Rome, jumped through burning coals; and on this account they were indulged with peculiar privileges by the Roman senate. Women also, we are told, were accustomed to walk over burning coals at Castabala, in Cappadocia,
near

near the temple dedicated to Diana. Servius remarks, from a work of Varro now lost, that the Hirpi trusted not so much to their own sanctity as to the care which they had taken to prepare their feet for that operation.

I am not acquainted with every thing that concerns the trial by ordeal, when persons accused were obliged to prove their innocence by holding in their hands red-hot iron; but I am almost convinced that this also was a juggling trick of the popes, which they employed as might best suit their views. It is well-known that this mode of exculpation was allowed only to weak persons, who were unfit to wield arms, and particularly to monks and ecclesiastics, to whom, for the sake of their security, that by single combat was forbidden. The trial itself took place in the church entirely under the inspection of the clergy; mass was celebrated at the same time; the defendant and the iron were consecrated by being sprinkled with holy water; the clergy made the iron hot themselves; and they used all these preparatives, as jugglers do many motions, only to divert the attention of the spectators. It was necessary that the accused persons should remain at least three days and three nights under their immediate care, and continue as long after. They covered their hands both before and after the proof; sealed and unsealed the covering: the former, as they pretended, to prevent the hands from being prepared any how by art; the latter to see if they were burnt.

Some artificial preparation was therefore known, else no precautions would have been necessary. It is highly probable that, during the three first days, the preventative was applied to those persons whom they wished to appear innocent; and that the three days after the trial were requisite to let the hands resume their natural state. The sacred sealing secured them from the examination of presumptuous unbelievers: for, to determine whether the hands were burnt, the three last days were certainly not wanted. When the ordeal was abolished, and this art rendered useless, the clergy no longer kept it a secret. In the thirteenth century an account of it was published by Albertus Magnus, a Dominican monk. If his receipt be genuine, it seems to have consisted rather in covering the hands with a kind of paste than in hardening them. The sap of the *althæa* (marsh-mallow), the slimy seeds of the flea-bane, which are still used for stiffening by the hat-makers and silk-weavers, together with the white of an egg, were employed to make the paste adhere; and by these means the hands were as safe as if they had been secured by gloves. The use of this juggling trick is very old, and may be traced back to a pagan origin. In the *Antigone* of Sophocles, the guards placed over the body of Polynices, which had been buried contrary to the orders of Creon, offered, in order to prove their innocence, to submit to any trial: "We will," said they, "take up red-hot iron in our hands, or walk through fire."

The exhibition of balls and cups, which is often mentioned in the works of the ancients, as the most common art of jugglers, is of great antiquity. It consists in conveying speedily, and with great dexterity, while the performer endeavours by various motions and cant phrases to divert the attention of the simple spectators from observing his movements too narrowly, several light balls, according to the pleasure of any person in company, under one or more cups; removing them sometimes from the whole; and conveying them again

again back in an imperceptible manner. In general, three leaden cups are used, and as many balls of cork; and to prevent all discovery by their slipping from the thumbs of the juggler, or making a noise, as he must lay hold of them with much quickness, the table before which he sits is covered with a cloth:

These small balls were by the ancients called *calculi*; and the cups *acetabula*, or *paropsides*. Casaubon has already quoted most of those passages in ancient authors which relate to this subject; and they have been repeated by Bulenger; but neither of these writers makes mention of the fullest and clearest description given in the letters of Alciphron. We have there an account of a countryman who came to town, and was conducted by a merchant to the theatre, where he saw, with great astonishment, the exhibition of cups and balls: "Such an animal," says he, "as the performer, I would not wish to have near me in the country; for, in his hands, my property would soon disappear." The art of oratory, because it deceives the auditors, is frequently compared to that of balls and cups. From the Latin word *gabata*, mentioned by Martial, together with *paropsides*, the French have made *gobelets*; and hence their common expressions *jouer des gobelets*, and *joueur des gobelets*, which they use when speaking of jugglers.

In all ages of the world there have been men who excited great wonder by extraordinary strength. Instances of this have been already collected; but they do not belong to this subject. Above fifteen hundred years ago, there were people who, by applying a knowledge of the mechanical powers to their bodies, performed feats which astonished every ignorant spectator; though it is certain that any sound man of common strength could perform the same by employing the like means. About the beginning of the present century, such a strong man, or Sampson, as he called himself, a native of Germany, travelled over almost all Europe; and his pretended art has been mentioned by so many writers, that we may conclude it had not been often exhibited before; and that it was then considered as new. His name was John Charles von Eckeberg; he was born at Harzgerode in Anhalt; and, at that time, was thirty-three years of age. When he fixed himself between a couple of posts, on any level place, two or more horses were not able to draw him from his position; he could break ropes asunder, and lift a man up on his knee while he lay extended on the ground. But what excited the greatest astonishment was, that he suffered large stones to be broken on his breast with a hammer, or a smith to forge iron on an anvil placed above it.

This last feat was exhibited even in the third century, by Firmus or Firmius, who, in the time of Aurelian, endeavoured to make himself emperor in Egypt. He was a native of Seleucia in Syria; espoused the cause of Zenobia, the celebrated Queen of Palmyra; and was at length executed publicly by order of the Emperor Aurelian. It is of this Firmus, and not of another, who a century after was overcome in Africa by the father of the Emperor Theodosius, that Vopiscus speaks where he relates that he could suffer iron to be forged on an anvil placed on his breast. For this purpose he lay on his back; but he put himself in such a position, by resting with his feet and shoulders against some support, that his whole body formed an arch; so that he seemed rather to be suspended than to

lie at full length. This art, which is explained and illustrated by Defaguliers, and Professor Kuhn of Dantzic, has now become so common that it is often exhibited without occasioning much surprise.

In the works of the ancients, rope-dancers are frequently mentioned. The passages where they occur have been collected by various authors, though never completely; and I am inclined to think that those who have seen many performers of this kind would be able to clear up some that are obscure.

We meet with various appellations given to rope-dancers, which do not, as some have imagined, point out different kinds, but allude only to new-invented arts, leaps, or dexterities, which, while recommended by novelty, were much wondered at, though they were afterwards imitated by all. To these belong the *schanobata*, *oribata*, *neurobata*, *petaminarii*, *funambuli*, &c. Some of the ancient rope-dancers seemed to have used a balancing pole, or, at least, to have had weights in their hands to preserve an equipoise. It is certain, also, that rope-dancers were not wanting in the middle ages.

To place men upon the shoulders of each other in such a manner that every row consists of a man fewer, till they form a pyramid ending in a single person, upon whose head a boy often stands with his feet upwards, is likewise an ancient piece of dexterity.

Hoops and wheels were employed by the *petaurista*, who excited great astonishment among the populace. The first part of the art may have consisted in nothing more than the varied contortions and tumbling which we still see practised by children trained for that purpose. Cilano explains a well-known passage of Manilius, as if the performers had darted through suspended iron hoops, made often red hot.

The art of exhibiting various feats of horsemanship, which is practised so much in modern times, seems to have come first from the East. At any rate, those performers in that way who, in the thirteenth century, were at the Byzantine court, and who travelled all over Europe, came from Egypt. They could stand on the horses when at a gallop; mount and dismount while on full speed at the chase; tumble on horseback, and do many other things equally extraordinary. At the end of the sixteenth century, an Italian, who had learned this art while a slave in Turkey, went about exhibiting his dexterity in various parts of Europe. Montagne saw him at Rome in 1581; and the year following he was at Paris. Some of these feats were performed by the ancient *desultores*.

Whether the ancients taught horses, dogs, birds, and other animals, to perform various tricks which are frequently exhibited at present for money, we do not know; but it is certain that what they made the elephant, which, undoubtedly, is the most sagacious and tractable of all animals, perform, exceeds every thing yet known of the kind. Without repeating what has been so often related, we shall only mention the elephant which walked upon a rope backwards and forwards, as well as up and down; and which Galba first caused to be shown to the Roman people. After this, so much confidence was placed in the dexterity of the animal, that a person sat on an elephant's back while he walked across the theatre upon a rope extended from the one side to the other. Lipsius, who has collected the testimonies, thinks they are so strong that they cannot be doubted.

The training of horses to obey a private signal, imperceptible to

the most attentive spectator, and to perform actions which appear, to those unacquainted with the art, to display rational faculties, are not mentioned in the works of the ancients. That the Sybarites, however, taught their horses to dance to the sound of music, is asserted by a variety of authors. In the sixteenth century, dogs trained in the like manner excited great wonder.

In the year 1766, Mr. Wildman of London, made himself much known by taming or training bees, in such a manner that they not only followed him wherever he went, but settled even on his face and hands without stinging him, and seemed as if obedient to his orders. Some years after, a person who practised the like art, travelled through Germany, and gave himself out to be Wildman; but Mr. Riem proved that he was not Wildman, and published the secret by which he acquired so much power over these insects. Whether the ancients were acquainted with this art is uncertain; but we shall here remark, that it was known in the kingdom of Galam, at Senegal, a hundred years before Wildman: for when Bruce, a Frenchman, was there, in 1698, he was visited by a man who called himself the king of the bees. "Let his secret," says that traveller, "consist in what it may, this much is certain, that they followed him wherever he went, as sheep do their shepherd. His whole body, and particularly his cap, was so covered with them, that they appeared like a swarm just settled. When he departed they went along with him; for, besides those on his body, he was surrounded by thousands which always attended him.

In modern times, persons destitute of arms and hands, or who have these limbs formed very imperfectly, but who possess the art of supplying that want by the use of their feet and toes, shew themselves sometimes for money; and, as they entertain the spectators by exciting their wonder, they deserve from them that support which they are not able to obtain in any other manner. Instances of such people who had acquired this art, have been very common within the two last centuries; but, in the works of the ancients, we have found only one. An Indian king named Porus, sent to the emperor Augustus an embassy with presents, among which were some rare animals, and a man without arms, who with his feet could bend a bow; discharge arrows; and put a trumpet to his mouth and blow it. Dio Cassius confesses that he did not know how this was possible; but Strabo refers for his authority to Nicolaus of Damascus, who saw all the presents, as they passed through Antioch. Had this deformed person, whom Strabo compares to a Hermes, travelled about, according to the modern practice, as a show, he would have been better known, and in all probability his example would have induced others to imitate his art.

Figures or puppets, which appear to move of themselves, were employed formerly to work miracles; but they could hardly be used for that purpose at present in any catholic country of Europe, though they still serve to amuse the vulgar. Among these are the *marionettes*, as they are called, the different parts of which are put in motion imperceptibly by a thread. Of a still more ingenious construction are those which are moved by the turning of a cylinder, as is the case in the machines with which some of the old miners in Germany earn a livelihood; but the most ingenious of all are those which are kept in continual movement for a certain time, by the help of wheels

with a weight or spring. The latter are called *automata*; and, when they represent human figures, *androides*. Under the former general name are comprehended our watches, the most useful of all, and also jacks, with many others. The latter appellation is given to small puppets, which, when their inner works have been wound up, run upon the table or pavement, and as they advance move their head, eyes, and hands. They have been exhibited sometimes under the name of *courante Margarethe*, which gave rise perhaps to the word *marionette*.

The proper *marionettes* are very old. They were common among the Greeks, and from them they were brought to the Romans. They were known by the name of *neurospasta*, and were much used at their shows. Aristotle speaks of some which moved their head, eyes, hands, and limbs, in a very natural manner. They are mentioned with equal precision by Galen, Xenophon, Antoninus, Horace, Gellius, and others. To these belong the *phalli*, which were carried round during the festivals of Osiris and Bacchus, and of which one member only, that properly meant by the name, and which was almost as large as the whole body, moved upon certain threads being pulled.

When clocks were brought to perfection, some artists added to them figures, which, at the time of striking, performed various movements; and, as they succeeded in these, some attempted to make, detached from clocks, single figures, which either moved certain limbs, or advanced forward and ran. In the middle of the sixteenth century, when Hans Bullman, a padlock-maker at Nuremberg, constructed figures of men and women which moved backwards and forwards by clock-work, and beat a drum, and played on the lute according to musical time, they excited universal astonishment as a new invention. It was about the same period that watches came into use. The accounts however which speak of much older automata deserve to be examined with more attention.

The most ancient of all are undoubtedly the tripods constructed by Vulcan, which being furnished with wheels advanced forwards to be used, and again returned to their places. But what was impossible to the gods of Homer? An unbeliever might conjecture that these tripods, which are mentioned also by Aristotle, and which perhaps were only a kind of small tables, or dumb waiters, had wheels so contrived, that they could be put in motion and driven to a distance on the smallest impulse.

That Dædalus made statues, which could not only walk, but which it was necessary to tie in order that they might not move, is related by Plato, Aristotle, and others. The latter speaks of a wooden Venus, and remarks, that the secret of its motion consisted in quicksilver having been poured into it. However this may be, it is astonishing that the Chinese should have fallen upon the invention of giving motion to puppets by means of quicksilver, and in so ingenious a manner that Muschenbroek thought it worth his while to describe their whole construction, and to illustrate it by figures. But, before this method was known in Europe, Kircher had an idea of putting a small waggon in motion by adding to it a pipe filled with quicksilver, and heating it with a candle placed below it. The account of Aristotle is more mysterious, for he does not inform us how the quicksilver acted.

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Calistratus, another writer, who was the tutor of Demosthenes, gives us to understand that the statues of Dædalus were made to move by the mechanical powers. But what has been asserted by Palæphatus, and by Gedoyn, Banier, Goguet, and others among the moderns, is most probable. The first statues of the Greeks were imitations of those of the Egyptians, for the most part clumsy figures, with their eyes shut, their arms hanging down close to the body on each side, and their feet joined together. Those made by Dædalus had their eyes open, as well as their feet and hands free; and the artist gave them such a posture, that they seemed either reclining, or appeared as if ready to walk or to run. As Anacreon, struck with wonder, exclaimed when he saw a waxen image of his beloved object, "Be gone, wax, thou wilt soon speak!" the astonished Greeks, in like manner, cried out, when they beheld the statues of Dædalus, "They will soon walk." The next generation affirmed that they really walked; and their posterity, adding still to what was told them, affirmed that they would have run had they not been bound.

Equally imperfect is the account given of the wooden pigeon constructed by Archytas of Tarentum. We are informed that it flew; but, when it had once settled, it could not again take flight. The latter is not incredible; but, even if we allow that ærostatic machines were then known, it is impossible to believe the former. At present one cannot determine with any probability, what piece of mechanism gave rise to this relation. The head of Albertus Magnus, which is said not only to have moved but to have spoken, is too little known for any opinion to be formed concerning it. The construction of it must have been very ingenious and complex, if it be true that he was employed upon it thirty years.

We shall here say a few words respecting an object of juggling, which, however old it may be, still excites astonishment, and has often imposed upon the credulity of men of learning. We mean those speaking machines, which, according to appearance, answer various questions proposed to them, sometimes in different languages, sing, and even blow a huntsman's horn. The figure, or only a head, is often placed upon a box, the fore part of which, for the better deception, is filled with a pair of bellows, a sounding-board, cylinder and pipes, supposed to represent the organs of speech. At other times the machine is only like a peruke-maker's block, hung round with a Turkish dress, furnished with a pair of arms, and placed before a table; and sometimes the puppet stands upon the table, or against a wall. The sounds are heard through a speaking-trumpet, which the figure holds in its mouth.

Many jugglers are so impudent as to assert, that the voice does not proceed from a man, but is produced by machinery, in the same manner as the music of an organ. Some are more modest or timorous, and give evasive answers to the questions asked them respecting the cause of the voice, with as much art as those who exhibit with balls and cups. Concerning these speaking machines, however, different opinions are entertained. Some affirm that the voice issues from the machine; others, that the juggler answers himself, by speaking, as ventriloquists do, from the lower part of his belly, or by having the power to alter his voice; and some believe that the answers are given by a man somewhere concealed. The
violence

violence with which these opinions are maintained exposes the juggler often to the danger of losing his life; for, when the illusion is detected, the populace, who in part suffer themselves willingly to be deceived, and who even pay the juggler for his deception, imagine that they have a right to avenge themselves for being imposed on. The machines are sometimes broken; and the owners of them are harshly treated as impostors. Yet we do not see why a juggler, with a speaking machine, is a more culpable impostor than he who pretends to breathe out flames and to swallow boiling oil, or to make puppets speak, as in the Chinese shadows. The spectators pay for the pleasure which they receive from a well-concealed deception, and with greater satisfaction the more difficult it is for them to discover it. But the person who speaks or sings through a puppet, is so well hid, that people of considerable penetration have imagined that such concealment was impossible. At present this art is well known. Either a child or a woman is concealed in the juggler's box; or some person, placed in a neighbouring apartment, speaks into the end of a pipe which proceeds through the wall to the puppet, and which conveys the answers to the spectators. The juggler gives every necessary assistance to the person by signs previously agreed on. The invention of causing statues to speak, by this method, seems so simple, that one can scarcely help conjecturing that it was employed in the earliest periods to support superstition; and many have imagined that the greater part of the oracles spoke in the same manner. This, however, is false, as has been proved by the Jesuit Baltus, and the author of an answer to Fontenelle's History of Oracles. It appears that the pagan priests, like our jugglers, were afraid that their deceptions, if long practised, might be discovered. They considered it, therefore, as more secure to deliver the answers themselves; or cause them to be delivered by women instructed for that purpose, or by writing, or by any other means. We read, nevertheless, that idols and the images of saints once spoke; for at present the latter will not venture to open their mouths. If their votaries ever really heard a voice proceed from the statue, it may have been produced in the before-mentioned manner.

Whether the head of Orpheus spoke in the island of Lesbos, or, what is more probable, the answers were conveyed to it by the priests, as was the case with the tripod at Delphi, cannot with certainty be determined. That the impostor Alexander, however, caused his Æsculapius to speak in this manner is related by Lucian. He took, says that author, instead of a pipe, the gullet of a crane, and transmitted the voice through it to the mouth of the statue. In the fourth century, when Bishop Theophilus broke to pieces the statues at Alexandria, he found some which were hollow, and placed in such a manner against a wall that a priest could slip unperceived behind them, and speak to the ignorant populace through their mouths.

That people ventured more than a hundred years ago to exhibit speaking machines for money, has been proved by Reitz in his annotations to Lucian, where he produces the instance of one Thomas Irfon, an Englishman, whom he himself knew, and whose art excited much wonder in King Charles II. and his whole court. When the astonishment, however, became general, one of the pages discovered, in the adjoining chamber, a priest who answered, in the
same

same language, through a pipe, the questions proposed to the wooden head, by whispering into its ear. This deception Irson often related himself.

We shall now add only a few observations respecting the Chinese shadows. This ingenious amusement consists in moving, by pegs fastened to them, small figures cut of pasteboard, the joints of which are all pliable, behind a piece of fine painted gauze placed before an opening in a curtain, in such a manner as to exhibit various scenes, according to pleasure; while the opening covered with gauze is illuminated, towards the apartment where the spectators sit, by means of light reflected back from a mirror; so that the shadows of the pegs are concealed. When it is requisite to cause a figure to perform a variety of movements, it is necessary to have several persons, who must be exceedingly expert. When a snake is to be represented gliding, the figure, which consists of delicate rings, must be directed, at least, by three assistants.

This amusement, which one can hardly see the first time without pleasure, is really a Chinese invention. We have seen Chinese boxes on which such moveable figures were apparent only when the box was held against the light. In China, these shadows are used at the well-known feast of lanterns; and a description of them may be found in the works of several travellers. That they were common also in Egypt, we are informed by Prosper Alpinus, who admired them much; but he was not able to discover the method by which they were produced, as it was then kept a secret.

SINGULAR CURE OF A YOUNG WOMAN, EFFECTED BY EXPELLING FROM THE STOMACH, &c. THE LARVÆ OF CERTAIN INSECTS.

THE account of this singular case was transmitted to M. Odhelius, at Stockholm, together with some of the larvæ, by M. Flank, surgeon of Carlstadt, who, during the course of forty years practice never saw any of the like kind discharged from the human body. The patient, who was seventeen years of age, and who for three years had been quite regular, became indisposed in the year 1786, and complained of a violent pain and griping in her stomach, with a head-ache and confusion in the morning, a burning in the throat, and great lassitude. These symptoms were lessened after repeated eructation; but the disorder still increased. Mineral-water with jalep-powder was prescribed, and the larvæ began gradually to be discharged; but, as the patient did not find much relief, and as she nauseated jalep-power, aloë-pills, with jalep resin, and mercurius dulcis, were administered in its stead, and about a quart of mineral-water each time; by which means these troublesome guests were gradually so completely expelled, that the patient, in the course of a few weeks, was perfectly cured. The larvæ were transmitted to the Cabinet of Curiosities belonging to the Academy of Sciences. Professor Wilke found, on examining them, that they were of the species described by Reaumur under the name of *vers a queue de rat*, (rat-tailed worms,) and which belong to a kind of two-winged fly, called the pendulous fly, *musca pendula* Linn. because the larvæ are suspended, as it were, by a long thread, which is their organ of respiration. These larvæ, which the professor examined, were

were of a yellowish-brown colour, from four to six lines in length, with a tail of about the same extent; a cylindric body, from half a line to a line in thickness, cut across somewhat obliquely before, and conical towards the tail. As the patient, before she fell ill, had used a great deal of milk and cheese, M. Wilke was of opinion, that some of the eggs of these flies had been conveyed into her stomach in the rind of the cheese.

SIGNS EXHIBITED BY ANIMALS WHICH INDICATE CHANGES OF THE WEATHER.

THE fluids and solids of organised beings, and their animal machines, are constructed in such a manner that a certain degree of motion puts them in a good state, while an augmentation or diminution of it deranges and destroys that state. The fluids, which by their nature are easily moved, as well as the fibres, which are highly susceptible of irritation, are readily affected by changes of the surrounding atmosphere, and suffer from their impressions, whether the air varies in its weight or qualities, or is changed in regard to its elasticity. We find, among those who are sound and in perfect health, vivacity, good spirits, and great agility, when the air is pure and elastic; on the other hand, when the air becomes light and damp, and is deprived of its elasticity, it throws the body into a state of languor and debility. Valetudinarians, whose constitutions are delicate, or who are advanced in life, are much sooner sensible of the impressions occasioned by changes of the weather than those who are strong and robust. In general, the senses of men who in their way of life deviate from the simplicity of nature, are coarse, dull, and void of energy. Those also who are distracted by a thousand other objects, scarcely feel the impressions of the air; and, if they speak of them to fill up a vacuum in their miserable and frivolous conversation, they do it without thinking of their causes or effects, and without ever paying attention to them. But animals which retain their natural instinct, which have their organs better constituted and their senses in a more perfect state, and which besides are not changed by vicious and depraved habits, perceive sooner, and are more susceptible of the impressions produced in them by variations of the atmosphere, and sooner exhibit signs of them.

Until the new discovery of animal electricity, little attention was paid to these signs, which were consequently ascribed to a certain natural prescience. But, as the electric matter issuing from the earth diffuses itself through the atmosphere, it must penetrate and agitate the frail machines in question; and, as it carries with it vapours and exhalations of various kinds, these must produce, on machines so delicate, different sensations, which make them move in a different manner; and, according as the received impression is agreeable or troublesome, they exhibit signs of joy or sadness; send forth cries, or are silent; move, or remain at rest; as is observed in all kinds of animals, without excepting man, when the weather is about to change.

In the last place, internal and animal electricity, which in all probability is the agent of life and the grand source of organic motion, must be as much subject to modifications as the external electricity, from which it acquires new force and activity by the vapours and humidity of the atmosphere, which absorbing the electric matter in abundance,

abundance, or serving it as a conductor, draws it off from the animal machine. Hence arises that languor and debility which are experienced during wet weather, and when the south winds prevail; and for the same reason the moisture which has penetrated the organs, at least those that are weak or have suffered any hurt or injury, or been exposed to some new agitation, produces uneasiness and occasions pain. It is difficult to explain clearly and with precision how all this takes place; that is, how the electricity is excited, and by what mechanism exhalations and vapours affect animals, and produce changes in their bodies, since we are not acquainted with the curious organisation of the most delicate parts of these machines; but we can observe and perceive the progress and general consequences of these phenomena, as well as of those by which they are produced. The following are the common and familiar signs exhibited by animals, which indicate changes of the weather, and which are not taken so much from the agricultural poet, who first collected them, as from common observation.

1. When the bats remain longer than usual abroad from their holes, fly about in greater numbers and to a greater distance than common, it announces that the following day will be warm and serene; but, if they enter the houses, and send forth loud and repeated cries, it indicates bad weather.

2. If the owl is heard to scream during bad weather, it announces that it will become fine.

3. The croaking of crows in the morning indicates fine weather.

4. When the raven croaks three or four times, extending his wings and shaking the leaves, it is a sign of serene weather.

5. It is an indication of rain and stormy weather when ducks and geese fly backwards and forwards; when they plunge frequently into the water, or begin to send forth cries and to fly about.

6. If the bees do not remove to a great distance from their hives, it announces rain; if they return to their hives before the usual time, it may be concluded that it will soon fall.

7. If pigeons return slowly to the pigeon-house, it indicates that the succeeding days will be rainy.

8. It is a sign of rain or wind when the sparrows chirp a great deal, and make noise to each other to assemble.

9. When fowls and chickens roll in the sand more than usual; it announces rain: the case is the same when the cocks crow in the evening, or at uncommon hours.

10. Peacocks, which cry during the night, have a presentiment of rain.

11. It is believed to be a sign of bad weather when the swallows fly in such a manner as to brush the surface of the water, and to touch it frequently with their wings and breast.

12. The weather is about to become cloudy, and to change for the worse, when the flies sting, and become more troublesome than usual.

13. When the gnats collect themselves before the setting of the sun, and form a sort of vortex in the shape of a column, it announces fine weather.

14. When sea-fowl and other aquatic birds retire to the sea-shore or marshes, it indicates a change of weather and a sudden storm.

15. If the cranes fly exceedingly high, in silence and arranged in order,

order, it is a sign of approaching fine weather ; but, if they fly in disorder, or immediately return with cries, it announces wind.

16. When the dolphins sport and make frequent leaps, the sea being tranquil and calm, it denotes that the wind will blow from that quarter from which they proceed.

17. If the frogs croak more than usual, if the toads issue from their holes in the evening in great numbers ; if the earth-worms come forth from the earth, and scorpions appear on the walls ; if the ants remove their eggs from their small hills ; if the moles throw up the earth more than usual ; if the asses frequently shake and agitate their ears ; if the hogs shake and spoil the stalks of corn ; if the bats send forth cries, and fly into the houses ; if the dogs roll on the ground, and scratch up the earth with their fore-feet ; if the cows look towards the heavens, and turn up their nostrils as if catching some smell ; if the oxen lick their fore-feet, and if oxen and dogs lie on their right side ; all these are signs which announce rain.

18. The case is the same when animals crowd together.

19. When goats and sheep are more obstinate and more desirous to crop their pastures, and seem to quit them with reluctance ; and when the birds return slowly to their nests, rain may soon be expected.

Other Signs which announce Changes of the Weather.

1. If the flame of a lamp crackles or flares, it indicates rainy weather.

2. The case is the same when the foot detaches itself from the chimney and falls down.

3. It is a sign of rain, also, when the foot collected around pots or kettles takes fire in the form of small points like grains of millet ; because this phenomenon denotes that the air is cold and moist.

4. If the coals seem hotter than usual, or if the flame is more agitated, though the weather be calm at the time, it indicates wind.

5. When the flame burns steady, and proceeds straight upwards, it is a sign of fine weather.

6. If the sound of bells is heard at a great distance, it is a sign of wind, or of a change of weather.

7. The hollow sound of forests ; the murmuring noise of the waves of the sea ; their foaming, and green and black colour, announce a storm.

8. Good or bad smells, seeming as if it were condensed, are a sign of a change of weather ; either because exhalations arise and are dispersed in more abundance, which is a sign of an increase of electricity ; or because the air does not dispel or raise these exhalations, which indicates that the constitution of the atmosphere is motionless, light, and void of elasticity.

9. When the spiders webs and the leaves of the trees are agitated without any sensible wind, it is a sign of wind, and perhaps of rain ; because it denotes that strong and penetrating exhalations arise from the earth.

10. These signs are less equivocal when the dry leaves and chaff are agitated in a vortex, and raised into the air.

11. A frequent change of wind, accompanied with an agitation of the clouds, denotes a sudden storm.

12. A want or too great a quantity of dew, being a mark of a strong

evaporation, announces rain : the case is the same with thick white hoar-frost, which is only dew congealed.

13. If salt, marble, and glass, become moist some days before rain ; if articles of wood, doors, and chests of drawers, swell ; if the corns on the feet and the scars of old wounds become painful ; all these signs indicate that aqueous vapours are exhaled from the earth, and are no doubt directed by the electric matter, which diffuses itself then in greater abundance and penetrates every body. Hence it happens that stones become moist, that wood swells, and salt becomes deliquescent by the moisture. When the stones after being moist become dry, it is a sign of fine weather.

14. On the other hand, when the weather inclines to rain, the water is seen to diminish in vases and fountains, because the humidity is then carried away by the evaporation of the electric matter.

15. It is certainly a surprising phenomenon to see the earth, after very long and very abundant rains, to be sometimes almost dry, the roads quite free from dirt, and the hands to become arid and parched. This is a sign that the rain has not altogether ceased, and denotes a continual efflux of electric matter, which being renewed carries with it, in the form of vapours, all the moisture that falls on the earth.

16. There is sometimes, however, a great deal of dirt even after a very moderate rain, which in that case is a sign of fine weather, because it indicates that evaporation has ceased. Dry stones and moist earth announce fine weather ; dry earth and moist stones announce rain.

17. The winds which begin to blow in the day-time, are much stronger, and endure longer, than those which begin to blow only in the night.

18. Weather, whether good or bad, which takes place in the night-time, is not, in general, of long duration ; and, for the most part, wind is more uncommon in the night than in the day-time. Fine weather in the night, with scattered clouds, does not last.

19. A Venetian proverb says, that a sudden storm from the north does not last three days.

20. The hoar-frost, which is first occasioned by the east wind, indicates that the cold will continue a long time, as was the case in 1770.

21. If it thunders in the month of December, moderate and fine weather may be expected.

22. If it thunders at intervals in the spring time, before the trees have acquired leaves, cold weather is still to be expected.

23. If the wind does not change, the weather will remain the same.

Such almost are the signs of the variations of the atmosphere ; but I will not be answerable for the certainty of them all. Plutarch, in his Problems, where it is asked why a horse who has escaped from a wolf becomes fleet, replies, that because, by a single action, but executed with great force and vigour, he has acquired a disposition to running and a habit of speed ; or perhaps, because he is naturally swift and agile : but he adds, perhaps neither of these is true. This observation, I am afraid, will apply to some of the vulgar prognostics of the present day. For example, we are told, that it is a sign of fertility in any year when a fly is engendered in an acorn of that year ; and that it is the sign of a pestilential year, if there issues from it a spider. Should the reason be asked, it might be replied, that neither of these is true. I might venture to say as much of those popular

popular tales in regard to certain critical days of the month; yet we must still have some respect for popular proverbs, which are often founded on observation and reason. Thus it is said, that if it rains on the 3d of May, the day of the Holy Cross; or on the 23d of April, St. George's day; or the 15th of June, St. Vitus's day, &c. in the first case the nuts will be spoiled; in the second, the figs; and in the third, the grapes. All this may be true to a certain degree, that is to say, when it rains for a certain number of days about these periods; because, if rain falls at the time when fruit-trees are in blossom, it carries off the fecundating farina, and by these means renders them barren.

In regard to the general qualities of the seasons, and their influence, attention may be paid to the following signs:—If the earth and air abound with insects, worms, frogs, locusts, &c. if the walnut-tree has more leaves than fruit; if there are large quantities of beans, fruit, and fish; if the spring and summer are too damp; if hoar-frost, fogs, and dew, come on at times when they are not generally seen; the year will be barren: the opposite signs announce fertility and abundance. Animals seem also to foresee and prognosticate fertility or barrenness: it is said that when the birds flock together, quit the woods and islands, and retire to the fields, villages, and towns, it is a sign that the year will be barren.

A great quantity of snow in winter promises a fertile year, but abundant rains give reason to apprehend that it will be barren. A winter, during which a great deal of snow and rain falls, announces a very warm summer. It is generally believed that thunder and storms in winter prognosticate abundance, because they fertilise the earth. When the spring is rainy, it produces an abundant crop of hay and of useless herbs, but at the same time a scarcity and dearth of grain. If it is warm, there will be plenty of fruit, but they will be almost all spoiled. If it is cold and dry, there will be few fruit or grapes, and silk-worms will not thrive. If it is only dry, there will be few fruit, but they will be good. In the last place, if it is cold, the fruit will be late in coming to maturity.

If the spring and summer are both damp, or even both dry, a scarcity and dearth of provisions is to be apprehended. If the summer is dry, there will be little corn: diseases will also prevail; but they will be more numerous if it is warm. If it is moderately cold, the corn will be late; but there will be a great deal of it; and the season will occasion few diseases.

A fine autumn announces a winter during which winds will prevail: if it is damp and rainy, it spoils the grapes, injures the sown fields, and threatens a scarcity. If it be too cold, or too warm, it produces many maladies. A long severity of the seasons, either by winds, drought, dampness, heat, or cold, becomes exceeding destructive to plants and animals. In general, there is a compensation for rain or drought between one season and another. A damp spring or summer is commonly followed by a fine autumn. If the winter is rainy, the spring will be dry; and, if the former is dry, the latter will be damp. When the autumn is fine, the spring will be rainy. That this alternation is in general verified may be seen in a Journal carried on for forty years, and formerly edited by M. de Poleni.

OF WONDER, OR THE EFFECTS OF NOVELTY.

IT is evident that the mind takes pleasure in observing the resemblances that are discoverable betwixt different objects. It is by means of such observations that it endeavours to arrange and methodise all its ideas, and to reduce them into proper classes and assortments. Where it can observe but one single quality, that is common to a great variety of otherwise widely different objects, that single circumstance will be sufficient for it to connect them all together, to reduce them to one common class, and call them by one general name. It is thus that all things endowed with a power of self-motion, beasts, birds, fishes, insects, are classed under the general name of animal; and that these again, along with those which want that power, are arranged under the still more general word substance: and this is the origin of those assortments of objects and ideas which in the schools are called genera and species, and of those abstract and general names, which in all languages are made use of to express them.

The farther we advance in knowledge and experience, the greater number of divisions and subdivisions of those genera and species we are both inclined and obliged to make. We observe a greater variety of particularities among those things which have a gross resemblance; and having made new divisions of them, according to those newly-observed particularities, we are then no longer to be satisfied with being able to refer an object to a remote genus, or very general class of things, to many of which it has but a loose and imperfect resemblance. A person, indeed, unacquainted with botany may expect to satisfy your curiosity, by telling you, that such a vegetable is a weed, or, perhaps in still more general terms, that it is a plant. But a botanist will neither give nor accept of such an answer. He has broken and divided that great class of objects into a number of inferior assortments, according to those varieties which his experience has discovered among them; and he wants to refer each individual plant to some tribe of vegetables, with all of which it may have a more exact resemblance, than with many things comprehended under the extensive genus of plants. A child imagines that it gives a satisfactory answer when it tells you, that an object whose name it knows not, is a thing, and fancies that it informs you of something, when it thus ascertains to which of the two most obvious and comprehensive classes of objects a particular impression ought to be referred; to the class of realities or solid substances which it calls *things*, or to that of appearances which it calls *nothings*.

Whatever, in short, occurs to us, we are fond of referring to some species or class of things, with all of which it has a nearly exact resemblance; and, though we often know no more about them than about it, yet we are apt to fancy that, by being able to do so, we show ourselves to be better acquainted with it, and to have a more thorough insight into its nature. But when something quite new and singular is presented, we feel ourselves incapable of doing this. The memory cannot, from all its stores, call up any image that nearly resembles this strange appearance. If by some of its qualities it seems to resemble, and to be connected with, a species which we have before been

been acquainted with, it is by others separated and detached from that, and from all the other assortments of things we have hitherto been able to make. It stands alone and by itself in the imagination, and refuses to be grouped or confounded with any set of objects whatever. The imagination and memory exert themselves to no purpose, and in vain look around all their classes of ideas in order to find one under which it may be arranged. They fluctuate to no purpose from thought to thought, and we remain still uncertain and undetermined where to place it, or what to think of it. It is this fluctuation and vain recollection, together with the emotion or movement of the spirits that they excite, which constitute the sentiment properly called *wonder*, and which occasion that staring, and sometimes that rolling of the eyes, that suspension of the breath, and that swelling of the heart, which we may all observe, both in ourselves and others, when wondering at some new object, and which are the natural symptoms of uncertain and undetermined thought. What sort of a thing can that be? What is that like? are the questions which, upon such an occasion, we are all naturally disposed to ask. If we can recollect many such objects which exactly resemble this new appearance, and which present themselves to the imagination naturally, and as it were of their own accord, our wonder is entirely at an end. If we can recollect but a few, and which it requires too some trouble to be able to call up, our wonder is indeed diminished, but not quite destroyed. If we can recollect none, but are quite at a loss, it is the greatest possible.

With what curious attention does a naturalist examine a singular plant, or a singular fossil, that is presented to him? He is at no loss to refer it to the general genus of plants or fossils; but this does not satisfy him, and, when he considers all the different tribes or species of either with which he has hitherto been acquainted, they all, he thinks, refuse to admit the new object among them. It stands alone in his imagination, and as it were detached from all the other species of that genus to which it belongs. He labours, however, to connect it with some one or other of them. Sometimes he thinks it may be placed in this, and sometimes in that other assortment; nor is he ever satisfied, till he has fallen upon one which, in most of its qualities, it resembles. When he cannot do this, rather than it should stand quite by itself, he will enlarge the precincts of some species, in order to make room for it; or he will create a new species on purpose to receive it, and call it a play of nature, or give it some other appellation, under which he arranges all the oddities that he knows not what else to do with. But to some class or other of known objects he must refer it, and betwixt it and them he must find out some resemblance or other, before he can get rid of that wonder, that uncertainty and anxious curiosity, excited by its singular appearance, and by its dissimilitude with all the objects he had hitherto observed.

As single and individual objects thus excite our wonder when, by their uncommon qualities and singular appearance, they make us uncertain to what species of things we ought to refer them; so a succession of objects which follow one another in an uncommon train or order, will produce the same effect, though there be nothing particular in any one of them taken by itself.

When one accustomed object appears after another, which it does
not

not usually follow, it first excites, by its unexpectedness, the sentiment properly called surprise, and afterwards, by the singularity of the succession, or order of its appearance, the sentiment properly called wonder. We start and are surprised at seeing it there, and then wonder how it came there. The motion of a small piece of iron along a plain table is in itself no extraordinary object, yet the person who first saw it begin, without any visible impulse, in consequence of the motion of a loadstone at some little distance from it, could not behold it without the most extreme surprise; and, when that momentary emotion was over, he would still wonder how it came to be conjoined to an event with which, according to the ordinary train of things, he could have so little suspected it to have any connection.

When two objects, however unlike, have often been observed to follow each other, and have constantly presented themselves to the senses in that order, they come to be so connected together in the fancy, that the idea of the one seems, of its own accord, to call up and introduce that of the other. If the objects are still observed to succeed each other as before, this connection, or, as it has been called, this association of their ideas, becomes stricter and stricter, and the habit of the imagination to pass from the conception of the one to that of the other, grows more and more rivetted and confirmed. As its ideas move more rapidly than external objects, it is continually running before them, and therefore anticipates, before it happens, every event which falls out according to this ordinary course of things. When objects succeed each other in the same train in which the ideas of the imagination have thus been accustomed to move, and in which, though not conducted by that chain of events presented to the senses, they have acquired a tendency to go on of their own accord, such objects appear all closely connected with one another, and the thought glides easily along them, without effort and without interruption. They fall in with the natural career of the imagination; and, as the ideas which represented such a train of things would seem all mutually to introduce each other, every last thought to be called up by the foregoing, and to call up the succeeding; so when the objects themselves occur, every last event seems, in the same manner, to be introduced by the foregoing, and to introduce the succeeding. There is no break, no stop, no gap, no interval. The ideas excited by so coherent a chain of things seem, as it were, to float through the mind of their own accord, without obliging it to exert itself, or to make any effort in order to pass from one of them to another.

But if this customary connection be interrupted, if one or more objects appear in an order quite different from that to which the imagination has been accustomed, and for which it is prepared, the contrary of all this happens. We are at first surprised by the unexpectedness of the new appearance, and, when that momentary emotion is over, we still wonder how it came to occur in that place. The imagination no longer feels the usual facility of passing from the event which goes before to that which comes after. It is an order or law of succession to which it has not been accustomed, and which it therefore finds some difficulty in following, or in attending to. The fancy is stopped and interrupted in that natural movement or career, according to which it was proceeding. Those two events seem to
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stand at a distance from each other; it endeavours to bring them together, but they refuse to unite; and it feels, or imagines it feels, something like a gap or interval betwixt them. It naturally hesitates, and, as it were, pauses upon the brink of this interval; it endeavours to find out something which may fill up the gap, which, like a bridge, may so far, at least, unite those seemingly distant objects, as to render the passage of the thought betwixt them smooth, and natural, and easy. The supposition of a chain of intermediate, though invisible, events, which succeed each other in a train similar to that in which the imagination has been accustomed to move, and which link together those two disjointed appearances, is the only means by which the imagination can fill up this interval, is the only bridge which, if one may say so, can smooth its passage from one object to the other. Thus, when we observe the motion of the iron, in consequence of that of the loadstone, we gaze and hesitate, and feel a want of connection betwixt two events which follow one another in so unusual a train. But when, with Des Cartes, we imagine certain invisible effluvia to circulate round one of them, and by their repeated impulses to impel the other, both to move towards it, and to follow its motion, we fill up the interval betwixt them, we join them together by a sort of bridge, and thus take off that hesitation and difficulty which the imagination felt in passing from the one to the other. That the iron should move after the loadstone seems, upon this hypothesis, in some measure according to the ordinary course of things. Motion after impulse is an order of succession with which, of all things, we are the most familiar. Two objects which are so connected seem no longer to be disjointed, and the imagination flows smoothly and easily along them.

Such is the nature of this second species of wonder, which arises from an unusual succession of things. The stop which is thereby given to the career of the imagination, the difficulty which it finds in passing along such disjointed objects, and the feeling of something like a gap or interval betwixt them, constitute the whole essence of this emotion. Upon the clear discovery of a connecting chain of intermediate events, it vanishes altogether. What obstructed the movement of the imagination is then removed. Who wonders at the machinery of the opera-house who has once been admitted behind the scenes? In the wonders of nature, however, it rarely happens that we can discover so clearly this connecting chain. With regard to a few even of them, indeed, we seem to have been really admitted behind the scenes, and our wonder accordingly is entirely at an end. Thus the eclipses of the sun and moon, which once, more than all the other appearances in the heavens, excited the terror and amazement of mankind, seem now no longer to be wonderful, since the connecting chain has been found out which joins them to the ordinary course of things.

That the imagination feels a real difficulty in passing along two events which follow one another in an uncommon order, may be confirmed by many obvious observations. If it attempts to attend beyond a certain time to a long series of this kind, the continual efforts it is obliged to make, in order to pass from one object to another, and thus follow the progress of the succession, soon fatigue it, and, if repeated too often, disorder and disjoint its whole frame. It is thus that too severe an application to study sometimes brings
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on lunacy and frenzy, in those especially who are somewhat advanced in life, but whose imaginations, from being too late in applying, have not got those habits which dispose them to follow easily the reasonings in the abstract sciences. Every step of a demonstration, which to an old practitioner is quite natural and easy, requires from them the most intense application of thought. Spurred on, however, either by ambition, or by admiration for the subject, they still continue till they become, first confused, then giddy, and at last distracted. Could we conceive a person of the soundest judgment, who had grown up to maturity, and whose imagination had acquired those habits, and that mould, which the constitution of things in this world necessarily impress upon it, to be all at once transported alive to some other planet, where nature was governed by laws quite different from those which take place here; as he would be continually obliged to attend to events, which must to him appear in the highest degree jarring, irregular, and discordant, he would soon feel the same confusion and giddiness begin to come upon him, which would at last end in the same manner, in lunacy and distraction. Neither, to produce this effect, is it necessary that the objects should be either great or interesting, or even uncommon in themselves. It is sufficient that they follow one another in an uncommon order. Let any one attempt to look over even a game of cards, and to attend particularly to every single stroke: and if he is unacquainted with the nature and rules of the game; that is, with the laws which regulate the succession of the cards; he will soon feel the same confusion and giddiness begin to come upon him, which, where it to be continued for days and months, would end in the same manner, in lunacy and distraction. But if the mind be thus thrown into the most violent disorder, when it attends to a long series of events which follow one another in an uncommon train, it must feel some degree of the same disorder, when it observes even a single event fall out in this unusual manner: for the violent disorder can arise from nothing but the too frequent repetition of this smaller uneasiness.

That it is the unusualness alone of the succession which occasions this stop and interruption in the progress of the imagination, as well as the notion of an interval betwixt the two immediately succeeding objects, to be filled up by some chain of intermediate events, is not less evident. The same orders of succession, which to one set of men seem quite according to the natural course of things, and such as require no intermediate events to join them, shall to another appear altogether incoherent and disjointed, unless some such events be supposed: and this for no other reason, but because such orders of succession are familiar to the one, and strange to the other. When we enter the work-houses of the most common artizans; such as dyers, brewers, distillers, we observe a number of appearances, which present themselves in an order that seems to us very strange and wonderful. Our thought cannot easily follow it, we feel an interval betwixt every two of them, and require some chain of intermediate events, to fill it up, and link them together. But the artizan himself, who has been for many years familiar with the consequences of all the operations of his art, feels no such interval. They fall in with what custom has made the natural movement of his imagination: they no longer excite his wonder, and if he is not a genius superior to his profession, so as to be capable of making the

the very easy reflection, that those things, though familiar to him, may be strange to us, he will be disposed rather to laugh at than sympathise with our wonder. He cannot conceive what occasion there is for any connecting events to unite those appearances, which seem to him to succeed each other very naturally. It is their nature, he tells us, to follow one another in this order, and that accordingly they always do so. In the same manner bread has, since the world began, been the common nourishment of the human body, and men have so long seen it, every day, converted into flesh and bones, substances in all respects so unlike it, that they have seldom had the curiosity to enquire by what process of intermediate events this change is brought about. Because the passage of the thought from the one object to the other is by custom become quite smooth and easy, almost without the supposition of any such process. Philosophers, indeed, who often look for a chain of invisible objects to join together two events that occur in an order familiar to all the world, have endeavoured to find out a chain of this kind betwixt the two events I have just now mentioned; in the same manner as they have endeavoured, by a like intermediate chain, to connect the gravity, the elasticity, and even the cohesion, of natural bodies, with some of their other qualities. These, however, are all of them such combinations of events as give no stop to the imaginations of the bulk of mankind, as excite no wonder, nor any apprehension that there is wanting the strictest connection between them. But as in those sounds, which to the greater part of men seem perfectly agreeable to measure and harmony, the nicer ear of a musician will discover a want, both of the most exact time, and of the most perfect coincidence: so the more practised thought of a philosopher, who has spent his whole life in the study of the connecting principles of nature, will often feel an interval betwixt two objects, which, to more careless observers, seem very strictly conjoined. By long attention to all the connections which have ever been presented to his observation, by having often compared them with one another, he has, like the musician, acquired a nicer ear, and a more delicate feeling, with regard to things of this nature. And as to the one, that music seems dissonance which falls short of the most perfect harmony; so to the other, those events seem altogether separated and disjointed, which fall short of the strictest and most perfect connection.

Philosophy is the science of the connecting principles of nature. Nature, after the largest experience that common observation can acquire, seems to abound with events which appear solitary and incoherent with all that go before them, which therefore disturb the easy movement of the imagination; which make its ideas succeed each other by irregular starts and sallies; and which thus tend, in some measure, to introduce those confusions and distractions we formerly mentioned. Philosophy, by representing the invisible chains which bind together all these disjointed objects, endeavours to introduce order into this chaos of jarring and discordant appearances, to allay this tumult of the imagination, and to restore it, when it surveys the great revolutions of the universe, to that tone of tranquillity and composure, which is both most agreeable in itself, and most suitable to its nature. Philosophy, therefore, may be regarded as one of those arts which address themselves to the imagination; and whose theory and history, upon that account, fall properly

within the circumference of our subject. It is the most sublime of all the agreeable arts, and its revolutions have been the greatest, the most frequent, and the most distinguished, of all those that have happened in the literary world. Its history, therefore, must upon all accounts be the most entertaining and the most instructive. For this reason we ought to examine all the different systems of nature, which, in these western parts of the world, the only parts of whose history we know any thing, have successively been adopted by the learned and ingenious; and, without regarding their absurdity or probability, their agreement or inconsistency with truth and reality, we should consider them only in that particular point of view which belongs to our subject; and content ourselves with inquiring how far each of them was fitted to soothe the imagination, and to render the theatre of nature a more coherent, and therefore a more magnificent, spectacle, than otherwise it would have appeared to be. According as they have failed or succeeded in this, they have constantly failed or succeeded in gaining reputation and renown to their authors; and this will be found to be the clue that is most capable of conducting us through all the labyrinths of philosophical history: for, in the mean time, it will serve to confirm what has gone before, and to throw light upon what is to come after, that we observe, in general, that no system how well soever in other respects supported, has ever been able to gain any general credit on the world, whose connecting principles were not such as were familiar to all mankind. Why has the chemical philosophy in all ages crept along in obscurity, and been so disregarded by the generality of mankind, while other systems, less useful, and not more agreeable to experience, have possessed universal admiration for whole centuries together? The connecting principles of the chemical philosophy are such as the generality of mankind know nothing about, have rarely seen, and have never been acquainted with; and which to them, therefore, are incapable of smoothing the passage of the imagination betwixt any two seemingly disjointed objects. Salts, sulphurs, and mercuries, acids, and alkalies, are principles which can smooth things to those only who live about the furnace; but whose most common operations seem, to the bulk of mankind, as disjointed as any two events which the chemists would connect together by them. Those artists, however, naturally explained things to themselves by principles that were familiar to themselves. As Aristotle observes, that the early Pythagoreans, who first studied arithmetic, explained all things by the properties of numbers; and Cicero tells us, that Aristoxenus, the musician, found the nature of the soul to consist in harmony. In the same manner, a learned physician lately gave a system of moral philosophy upon the principles of his own art, in which, wisdom and virtue were the healthful state of the soul; the different vices and follies, the different diseases to which it was subject; in which the causes and symptoms of those diseases were ascertained; and, in the same medical strain, a proper method of cure prescribed. In the same manner also, others have written parallels of painting and poetry, of poetry and music, of music and architecture, of beauty and virtue, of all the fine arts; systems which have universally owed their origin to the lucubrations of those who were acquainted with the one art, but ignorant of the other; who therefore explained to themselves the phenomena,

in that which was strange to them, by those in that which was familiar; and with whom, upon that account, the analogy, which in other writers gives occasion to a few ingenious similitudes, became the great hinge upon which every thing turned.

DIVISION OF TIME.

THE question respecting the day of the month on which the present century ought to terminate, whether on the 30th of December, or on the 31st; the following arguments have been adduced in support of the former:

There is no correct account respecting the ancient division of time; it is said by some, the Egyptian years were our months: the Arcadians divided their year into three months, the Romans into ten. This division Romulus made, viz. March, April, May, June, Quintilis, Sextilis, September, October, November, and December; Quintilis and Sextilis were afterwards changed into July and August, in honour of the two Cæsars. Numa added January and February. Even this increase divided the year into only 354 days; the eleven days he doubled every second year, and made another month, called Meridomis; this intercalation was left to the priests, who frequently omitted it: thus feasts fell on different times. Julius Cæsar, to rectify this, made one year 15 months; he then added the 11 days to the 354, making the year 365 days, equal to the course of the sun within six hours; these hours were left alone till they made one day; every fourth he placed this day in that part of the calendar where the intercalary month used to be put, viz. five days before the end of February, and sixth of the calends of March; for this year the supernumerary day was called Bissextus; this is called the Julian period, and would have been correct, had the sun apparently finished its revolution in 365 days 6 hours. The interval of time from the sun's leaving the first point of Aries, till his return to it, is 365 days, five hours, 48 minutes, and 48 seconds, being 11 minutes and 12 seconds less than the Julian computation: this in a century makes a difference of 18 hours 24 seconds.—At the time of the council of Nice, in 1582, it was found that the sun had entered the equinoctial circle on the 11th of March instead of the 21st. Pope Gregory XIII. took these ten days out, and ordered that the 11th should be deemed the 21st. This was called New Style, and immediately adopted in every country which acknowledged the pope's supremacy—not admitted in England till the middle of this century. To prevent this difference again occurring, the pope ordered every 100th year should be a common year, not a leap-year. This will lead into an error on the contrary side; every century the difference does not amount to one day; to render it more equal, every 400th year should be leap-year. Thus the century should close on the 30th of December, and at the same day; three centuries out of four.

THE SPIDER.

THE spider, of all the domestic insects, has hitherto been most generally abhorred, owing partly to its hideous form, and partly to the idea of its being poisonous. A discovery was, however, made some years ago, by Mr. Quatremere d'Isjonvål, adjutant-general

neral to General Pichegru, that this insect is not so useless as it is generally thought. It is generally known, that the state of the atmosphere has a visible effect upon certain animals, and that for instance cats, dogs, frogs, hogs, &c. have a very strong presentiment of every change which is preparing in it. The above-mentioned gentleman has discovered that the spider possesses this quality in a more eminent degree than all other animals.

The spider, says Mr. Q. d'Isjonval, is a more unerring indicator of impending changes in the atmosphere than the best barometer. These insects have two different ways of weaving their webs, by which we can know what weather we are to have. When the weather inclines to turn rainy or windy, they make the principal threads, which are the foundation as it were of their whole web, very short, and rather thick; whereas they spin them much longer when fine and warm weather is to be expected. Thence it appears clearly, that the spiders have not only a near but also a distant presentiment of the changes which are preparing in the air. The barometer foretells the state of the weather with certainty only for about twenty-four hours, whereas we may be sure that the weather will be fine twelve or fourteen days, when the spider makes the principal threads of its web long. It is obvious how important the consequences of this infallible indication of the state of the weather must be in many instances, particularly with regard to the operations of agriculture; for which reason it has been frequently lamented, that the best barometers, hydrometers, thermometers, and eudiometers, are principally in the hands of the consumers, and very rarely in those of the planters, of the harvest. How fortunate is it, therefore, that provident Nature, amongst other gifts, also has bestowed upon the cultivator of the country such a cheap instrument, upon the sensibility and infallibility of which, with regard to the impending changes in the atmosphere, he can rely! The barometers are frequently very fallible guides, particularly when they point to settled fair; whereas the work of the spider never fails to give the most certain information. This insect, which is one of the most economical animals, does not go to work, nor expends such a great length of threads, which it draws out of its body, before the most perfect equilibrium of all the constituent parts of the air indicates with certainty that this great expenditure will not be made in vain. Let the weather be ever so bad, we may conclude with certainty that it will not last long, and soon change for settled fair, when we see the spider repair the damages which his web has received. Those who will take the trouble to watch the operations of this useful insect, will be convinced, by experience, that Mr. Q. d'Isjonval deserves the thanks of his contemporaries for the communication of his important discovery, and, in future, shew more indulgence to this object of almost general abhorrence than they have done hitherto.

WET DOCKS AT WAPPING.

ON a subject so interesting to the mercantile part of the metropolis as the present, we conceive that many of our readers may wish for more information than what has yet been laid before the public. The following is the topographical description of those works which
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are intended to be carried into execution by the West-India and other merchants, and which only wait for the sanction of parliament.

The place where they are to be formed is that low flat part of Wapping which lies, between Ratcliff-highway and the river Thames, and between each extremity of which the river forms an arch of about one third of a circle; namely, from Shadwell-dock to Hermitage-dock, at both which places there are to be gates; the former for the entrance of large ships, the latter for craft. There is also to be another gate for large ships at Wapping Old Stairs; at the entrance of which and the Shadwell gates, there is to be a bason at each; besides which, there will be three large docks that will accommodate 390 ships with room for shifting and lighters. The two basons will contain 50 ships; so that there will be in all 440 loaded ships. There is to be another dock at the entrance of Hermitage gates, for the use of lighters and craft. The premises consist at present principally of gardens, meadows, wailes, and rope-grounds. Round each dock and bason there are to be quays and warehouses for landing and storing of goods, and the whole premises will be surrounded by walls. The boundaries will be Pennington-street on the north side, the direct line of which street is to be continued as far as Fox's-lane, which will be the boundary on the east. Nightingale-lane, will bound the premises on the west, and Hermitage-street and Worcester-street, form part of the boundaries on the south side.

This plan, which for the last three or four years has been under the consideration of parliament each session, in the shape of a bill, without being yet passed into a law, underwent a laborious investigation before a committee of the house of commons, in the months of February, March, April, and May, last. The report of the committee has been printed, together with the proceedings of the committees who sat on the bill in former sessions.

From all these printed documents it appears, that the measure has met with very great opposition from numbers of persons, both as public bodies and private individuals. The principal ground of objection has been, the injury which those parties would sustain in regard to property in privileges, in case the proposed docks should be carried into execution. It has been farther objected, that the plan would not answer the objects intended by it; because the ships for whose accommodation it was intended, could not, without great risk, enter the docks; and that if they did enter they would be very much exposed to accidents from fire, which, on account of ships lying so close together, and the difficulty of their speedy removal, would communicate more rapidly than if the ships lay in the river. A third objection has been, that of the defalcation which the revenue would suffer in consequence of the destruction of so many houses that now pay the king's taxes.

The two latter objections have been principally urged by the city of London in its corporate capacity, whose petition to the house of commons was referred to the committee on the bill; and evidence was heard in support of it. On this occasion it was stated by three West-India captains, and two Trinity pilots, that the greatest burthen of ships which could in the general course of trade come up with safety when loaded, as far as the proposed docks, or which they would trust so far, was from 250 to 260 tons; and that they would
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not venture to bring up so far, any ship which drew more than 14 or 16 feet of water. This was owing to the number of shoals above Deptford, and the interruption from colliers, which often caused ships drawing 16 feet water to be detained eight, ten, and fourteen, days, while navigated outward, from the Pool to Blackwall. They also stated, that the lower gates of the proposed docks at Shadwell could not be used unless the great body of colliers occupying that place was removed; and there was no other part of the pool where these colliers could find a sufficient depth of water. And besides, if loaded ships, drawing 16 feet, were to arrive at the proposed docks, and not be able to get in at the same tide (which would frequently happen), they could not lie afloat at either of the gates at low water, particularly in spring-tides, or during the continuance of strong westerly winds, which sometimes cause the water to be four or five feet lower than the natural tides.

On the ground of defalcation in the public revenue, it was stated that the number of houses which would be taken down or destroyed amounted to 2,199; the assessments of these amounted to 20,445l. a-year, the rate on which was, in general, 15d. in the pound; and the expence of purchasing all these premises would amount to no less than a sum of 511,375l. without including good-will. The city comptroller also produced the title of the city of London to the conservancy of the river Thames and waters of Medway, from the bridge of Staines to a place called Yendall, towards the sea; which title existed by prescription and charters so early as the reign of Richard I. and was confirmed by confession of the attorney-general and judgment of the court of exchequer in the 3d of James I.

Those who objected to the plan on the ground of its injuring their property, were the proprietors of certain quays called Legal Quays, and of warehouses situated thereon: the proprietors of other warehouses, Mr. John Perry, of Blackwall; Messrs Wells, of Rotherhithe, ship-builders; the college of Mary Magdalen, Oxford, which owned certain wharfs in Southwark; the company of the Shadwell water-works, which must be destroyed if the proposed docks were made; the owners of Irongate wharfs; the owners of Sufferance wharfs; Mr. Thomas Roycroft, of London, merchant; several proprietors of ship-yards and dry docks, in the port of London; the commissioners of sewers for the Tower hamlets; the churchwardens and overseers of the parish of St. George, Middlesex; the scholars of King's-hall and Brazen Nose college, Oxford, as patrons of the rectory of St. Dunstan's Stepney, &c. the Rev. Dr. Braithwaite, rector of the said parish; the Rev. Dr. Willis, rector of the parish of St. John, Wapping; the inhabitants of Billingsgate ward; ditto of Tower ward; the company of watermen, wherry-men, and lightermen, between Gravesend and Windsor; the goldsmiths' company, &c. &c.

In answer to these and many other important objections, Mr. Daniel Alexander, a surveyor, stated in evidence to the committee, that he had made a survey of the place intended for the docks in question; that the situation of Wapping was a natural marsh, considerably below the level of high-water mark, and that in this, as well as in a variety of other respects, the making of wet-docks in that spot was perfectly eligible and practicable. The depth of water proposed to be made in the docks was 22 feet; the width of

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the entrance from the river 46 feet, and the number of acres to be excavated, about 51. The fill of the entrance lock was intended to be six feet below the low-water mark of a spring-tide. He thought it would be practicable, if necessary, to deepen the bed of the river in places where there were shoals. The number of houses and tenements to be purchased would amount to 2074, of which it would be necessary to take down only 1288 for completing all the docks and basons. The other 786, remaining on the borders of the docks, might be taken down only as convenience should require. Of these houses and tenements, 1483 are old, and many of them falling down; 1170 are rated as poor in the tax-books, or under 6 or 7l. a-year annual value. The majority of the houses being in a very bad condition, the purchase-money of the whole, at eighteen or nineteen years purchase, would amount to 370,683l. and he did not conceive that the good will would amount to more than 5l. per cent. on the whole value. The low situation designed for the docks would considerably diminish the expence of excavation. Part of these docks could be so far finished in three years as to afford accommodation to 150 sail of ships; and, if that quantity of accommodation should be found to be sufficient for the purpose, the total execution of the plan would not become necessary.

The next person examined in support of the bill was Captain Alexander Murray Shields, surveyor of shipping for the underwriters at Lloyd's. He stated, that the inconvenience attending the shipping in the port of London, for want of accommodation; the great risk from the crowded state of the river; and the great delay occasioned by these, were highly injurious to the commerce of London. Ships drawing 18 feet water might navigate with safety into the proposed docks; and, if the dock-gates were made six feet below low-water mark, ships drawing 20 feet might enter. Large ships might deliver better in the deep-water tiers in the pool, than at most of the mooring-chains at the Red-house, at Deptford. One-eighth part of the West-India ships, until the last year, delivered at Deptford, for want of accommodation in the pool. Ships of 300 tons, and drawing 18 feet water, have frequently discharged in the pool. He knew of no impediments in the navigation from Deptford to the pool, more than from Woolwich to Deptford. He thought, that, if docks were formed at Wapping, ships would so frequent them as to give greater room in the pool, as well as freedom of navigation in the river; and that the ships which would usually come there would be West-Indian, Levant, Hamburgh, American, and tobacco ships in particular. He saw docks in other countries, and never knew of any accidents by fire in them; and, if fires were to happen, he thought the risk would not be greater to ships in dock than ships in the river. Ships could discharge their cargoes with much more expedition in docks than in the river, because ships in the river depend on the tides to get down their craft, which often get athwart tiers, and are detained a whole tide.

Mr. John Rennie, a civil engineer, said he had examined the premises in question, and was of opinion that the making of docks, basons, &c. there, was very practicable. The expence of making those works he estimated at 591,214l. The use of the basons was to be for ships to go into or come out of the tide-way; and the docks were to be the places where vessels should discharge or take in their cargoes.

cargoes. The few shoals between the pool and Deptford that might obstruct the the passage of ships into the docks, might be levelled at a moderate expence. The walls by which the whole of the premises should be surrounded would cost 17,171*l*. In order to prevent accidents by fire, he would propose that extinguishing engines should be placed on different parts of the quays, which might be worked by steam-engines, and which steam-engines would be of great use in working the cranes. Floating-engines might also be placed in the docks, for the use of ships moored at a greater distance from the quay: but, should even these fail, the vessel on fire might easily be scuttled. The whole of the docks might be finished in 4 or 5 years.

Several other persons of great skill and experience declared, that the only preventive to large ships coming up to the place of the intended docks was the crowded state of the pool, which these docks would remedy; that plunderage and smuggling would be effectually prevented; and that the revenue, of course, would considerably increase, as well by these preventions, as by the great expedition with which ships could discharge and take in their cargoes. Among these witnesses, Mr. Irving, inspector of exports and imports of Great Britain, delivered in some very sensible observations, in writing, on the subject, wherein he strongly recommended the plan for the accommodation of the port of London, as necessary to secure, on the return of peace, the continuance of that extensive commerce the country now possesses.

The following are the sentiments of Mr. Irving on this subject: "In looking forward to the period of peace, when we may expect that those countries which were formerly our rivals in trade (but whose commerce and manufactures have in a great measure been annihilated by the war) will attempt to resume their competition, it will, I am persuaded, be found highly for the interest of this country to remove some of those burthenome regulations under which our trade at present labours, in order not only to secure a continuance of the extensive commerce we now possess; but also to extend and improve it in future. Of these, the heavy advance of duties at perhaps a much earlier stage than the safety of the revenue requires, and the immense expence of port-charges, particularly in port of London; are objects which more immediately claim attention.

"Commerce early becoming an object of importance in this country, and the merchants being possessed of a large proportion of the circulating money, it was natural for the state to look to imposts on trade as a source of revenue. This system of taxation, which commenced at a period almost coeval with the origin of our foreign commerce, has ever since been progressively extended; and at this time we draw upwards of nine millions of pounds, gross revenue, from the duties on imports and exports; of which above five millions five hundred thousand pounds are collected immediately on importation. The advance of so large a sum at a period much earlier than the safety or interest of the revenue demands, and of which about one million five hundred thousand pounds are repaid on exportation, must not only prove extremely distressing to the merchant, but also the means of actually drawing so much money, together with the mercantile credit fairly attached thereto, out of the active capital of trade, for which the public receives no adequate compensation by the temporary use of the money.

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"This heavy advance of duties has also hitherto been the means, in part, of depriving us of a branch of trade to which we have the fairest pretensions.

"As a general depot of the products both of the north and south of Europe, and also of the eastern and western world, we possess many great and striking advantages, from our local situation, relatively both to Europe and America; from our possessing almost a complete monopoly of the trade of India and China; from the variety and superior qualities of our manufactures, suited to every market; from the powerful influence of our great mercantile and manufacturing capital; and, from the wisdom, energy, and enterprising spirit, of our merchants.

"By admitting all the principal articles of merchandize to be deposited in warehouses immediately on importation, and requiring no part of the duties to be advanced till delivered out for home consumption, or, if exported, to be subject to no duty whatever, the revenue would also, in my humble opinion, be greatly benefited.

"The profit the merchant expects, is generally in proportion to the capital he employs, and to the length of time he is in advance of that capital. Thus, by the duties being paid, perhaps six months earlier than (as has already been observed) the safety of the revenue requires, and from the articles generally passing through the hands of several different dealers, each of whom, considers himself entitled to a profit on the money he invests, the price is greatly advanced to the consumer, and a powerful temptation is thereby held out to the smuggler to enter into a competition with the fair trader. The same remark also applies, with equal force, to the state of our competition in foreign markets, particularly in East and West India commodities.

"The business of the custom-house, which, from the present complicated state of the laws and regulations, is almost entirely transacted by brokers, at a very heavy expence to the merchants, would be greatly lessened by the warehousing system. A cargo, on its arrival, would, perhaps, be admitted into the warehouse by the operation of one single entry, which every merchant's clerk would, I conceive, be competent to make; and, when delivered out for home consumption, or for exportation, the entries required would be simple and easy.

"But this system of warehousing all goods on importation, would be essentially aided by the plans which have been in agitation for some time past, of erecting close docks and warehouses on the river Thames. Ships on their arrival would proceed directly into those docks, and be discharged of their cargoes under the immediate eye of the principal out-door officers of the customs; without being subjected, in any degree, to those enormous depredations which are at present so loudly, and, I believe, so justly complained of; whilst a great saving would, at the same time, accrue to the revenue, by a reduction of the number of officers in what is called the water-guard.

"This system would also in a great degree put an end to those extensive frauds, which it is generally admitted have hitherto been practised in obtaining drawbacks on goods reported for exportation. Instead of the feeble check of an examination by the searchers, which, I believe, is the only security the revenue at present has, the goods would be deposited, immediately on importation, in warehouses, and there remain in security until they were conveyed from thence on-board the respective vessels for exportation."

Besides the above statements, Mr. Irving, in answer to questions put to him, said, that the commerce of Liverpool and Hull, particularly the former, had rapidly increased of late, inasmuch, that in his opinion the exports of British manufactures from these two ports alone exceeded in value the exports from the port of London.

Few people know that 256 years ago, in the 35th year of the reign of King Henry VIII. it was enacted by parliament, that Wapping-Marsh, in the county of Middlesex, should be divided, by certain persons assigned for that purpose, or any six of them; and that Richard Hill, of London, mercer, (the assignee of Cornelius Wandersdelf, who at his own charge had inned and recovered the same,) should have one moiety thereof to him and his heirs. The recovery of Wapping from the water, seems, therefore, to have been thought a work of great merit in the days of Harry the Eighth; but in our days, strange to tell, it would be thought by many people a work of more merit to replace the water over Wapping again.

ESTABLISHMENT OF A PAUPER POLICE.

THE opulent inhabitants of the cities of London and Westminster have been long distinguished for their generous donations in relieving the distresses of the poor; but, we wish to see something more effectual than temporary assistance established, and, we therefore, recommend to the public the adoption of Mr. Colquhoun's excellent plan for the establishment of a police to administer to the wants of the casual poor in the metropolis. He suggests the following mode of defraying the expence of the establishment:

Towards defraying the whole expence of this establishment it is proposed, that (in lieu of the casual charity, paid at present by all the parishes in the metropolis; which under this system will cease, together with the immense trouble attached to it) each parish in the metropolis shall pay into the hands of the receiver of the funds of this pauper police institution, a sum equal to what was formerly disbursed in casual relief, which, for the purpose of elucidation, is estimated as follows:—

97 Parishes within the walls, average 10l. each	-	£.970 0 0
16 Parishes without the walls, average 60l. each	-	960 0 0

1,930 0 0

23 Out-parishes in Middlesex and Surry, average 100l. each	-	2,300 0 0
10 Parishes in Westminster, average 100l. each	-	1,000 0 0

146 £.5,230 0 0

This sum (which is supposed to be not much above one half of the average annual disbursements of the 146 parishes above-mentioned, especially since it has been shewn, that the expence in St. Giles's and St. George's Bloomsbury alone, has been 2,000l. in one year) will probably, with economy and good management, be found sufficient for all the relief that is required; more especially as the object is not to maintain the indigent, but to put them in a way of supporting themselves by occasional pecuniary aids, well and judiciously applied.

The experiment is certainly worth trying. In its execution some of the most respectable and most intelligent individuals in the metropolis would gratuitously assist the commissioners, who, as taking respon-

responsibility upon them, in the direction of a most important branch of police, ought, undoubtedly, to be remunerated by government, especially as it is scarcely possible to conceive any mode in which the public money could be applied, that would be productive of such benefit to the state.

If that resulted from the design, which may reasonably be expected, it would of course extend to other great towns, as the soup establishments have done, and the condition of the poor would undergo a rapid change. The destitute and forlorn would then have some means of communicating their distress, while information and facts of the greatest importance, to the best interests of society, would spring from this source.

With respect to the general affairs of the poor, much good would arise from consolidating the funds of all the parishes in the metropolis.

The poor, for instance, who are supported from the parochial funds of Bethnal Green, and other distressed parishes in the eastern parts of the metropolis, are the labourers of the citizens and inhabitants of the 97 parishes within the walls, who, although opulent, pay little or nothing to the poor, since the city affords no cottages to lodge them.

Why, therefore, should not the inhabitants of the rich parishes contribute to the relief of the distresses of those who waste their strength in contributing to their ease, comfort, and profit? In several of the most populous parishes and hamlets in the eastern parts of the town, the poor may actually be said to be assessed to support the indigent. In the very populous hamlet of Mile-End New Town, where there is scarcely an inhabitant who does not derive his subsistence from some kind of labour, the rates are treble the assessments in Mary-le-bonne, where opulence abounds. Nothing can exceed the inequality of the weight for the support of the poor in the metropolis; since, where the demand is greatest, the means of supply are always most deficient and inadequate.

HOOLE'S TRANSLATION OF LEEUWENHOEK.

THE Microscopical Discoveries of the accurate and laborious Leeuwenhoek have been lately translated from the Dutch and Latin by Mr. Samuel Hoole, and are now publishing by subscription in parts. We have the translator's permission to make some occasional extracts, though the work is not yet complete. We shall begin, without farther apology, from the introduction.

"To those who are acquainted with the works of Mr. Leeuwenhoek, or who have been much conversant in microscopical studies, this introduction may appear unnecessary: but, those to whom the subject is new, will find so many wonders laid open to their view, as perhaps to induce a doubt of the author's accuracy in his observations, or his veracity in his narrations. Indeed, the extreme minuteness of many of the subjects on which he treats, is in some instances beyond the reach of our capacities to comprehend, although we may be fully assured of their existence. In fact, it appears by Mr. Leeuwenhoek's writings, that the difficulty now stated, was made a matter of objection by several of his co-temporaries; therefore, the following passage in his own words, will serve to state the objection, and the manner in which it was answered by the author himself:"

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'I have often heard, that many persons dispute the truth of what I advance in my writings, saying that my narrations concerning animalcules, or minute living creatures, are merely of my own invention. And, it seems, some persons in France have even ventured to assert, that those are not, in truth, living creatures, which I describe, as discoverable to our sight, and allege, that, after water has been boiled, those particles in it, which I pronounce to be animalcules, will be still observed to move. The contrary of this, however, I have demonstrated to many eminent men, and I will be bold to say, that those gentlemen who hold this language, have not attained to a degree of proficiency to observe such objects truly. For my own part, I will not scruple to assert, that I can clearly place before my eye the smallest species of those animalcules concerning which I now write, and can as plainly see them endued with life, as with the naked eye we behold small flies or gnats sporting in the open air, though these animalcules are more than a million of degrees less than a large grain of sand. For I not only behold their motions in all directions, but I also see them turn about, remain still, and sometimes expire; and the larger kinds of them I as plainly perceive running along, as we do mice with the naked eye. Nay, I see some of them open their mouths, and move the organs or parts within them; and I have discovered hairs at the mouths of some of these species, though they were some thousand degrees less than a grain of sand.'

"This passage respects the size of animalcules, which the author represents by comparison with the known size of a grain of sand; other minute objects which he frequently describes, are, the vessels in the bodies of insects, the threads of spiders, the filaments or threads of wool, the fibres composing the flesh of animals, and the like. All these he considers as of a cylindrical form, that is to say, if hollow, like a round pipe, and, if solid, like a round stick, wire, or rope; and he conveys to his readers an idea of their minuteness, by comparing them with the known size of a single hair. The method used by him in ascertaining this proportion he describes as follows: 'In examining the intestines of flies and other insects by the microscope, I have discovered vessels conveying the blood and juices, the smallest ramifications or branches whereof appeared to me more than two hundred thousand times less than a hair of my beard. And I will explain how I compute this proportion, which to many may appear wonderful. I have a plate of copper, with many lines engraven on it, and divided into a number of small equal parts. I then carefully observe how many of these parts one hair taken from my beard, and seen through the microscope, appears to cover. Supposing that the diameter of this hair, when magnified, appears equal to fifty of those parts, then with the point of a needle I trace on the copper a line of the same size by the naked-eye as is equal to one of those small veins or vessels, in a fly, seen through the microscope; and I find that nine of those small lines so traced with a needle, when placed close together, are a fiftieth part of the diameter of the hair. If then 450 diameters of those small veins which I most plainly see in a fly are no more than equal to the diameter of one hair taken from my beard, it follows, by the rules of arithmetic, that one of such hairs is more than 200,000 times larger than those very small blood-vessels in a fly.'

"Mr.

"Mr. Leeuwenhoek here considers the hair to be round, as well as the small vessels he alludes to, and, supposing each of these to be cut through or across the middle, the section would exhibit a circle. Now, the areas of circles being in proportion to the squares of their diameters, the author's proposition is mathematically demonstrated thus: $450 \times 450 = 202,500$."

Of the WEEVIL or CORN-BEETLE; wherein the common opinion that this insect is bred in corn spontaneously, is shewn to be erroneous; the true nature of its generation explained, with the means to preserve corn from its infection.

"I have heard it strongly argued, that the weevil or corn-beetle, (which is a very noxious insect, well known to the corn-dealers and bakers,) is produced by what is called equivocal or spontaneous generation, that is to say, from inanimate substances without any parent. The principal reasons alleged in support of this opinion are, that we often find this insect in a new granary, where never wheat was kept before; and, therefore, it is deemed a necessary conclusion, that such weevils are not propagated by the ordinary course of generation. Again it is said, that we may open many grains of wheat, which are sound and uninjured, so that no mark of perforation or hole shall be discernible on the outside, yet within these grains shall be found perfectly-formed and living weevils.

"The answer which I have given to these arguments has been, that these animals may, by ourselves, be removed from one granary to another without our knowledge: for supposing the person employed to remove corn, to have come out of a granary, or barn, infested with weevils, he may easily carry some grains of corn containing them, or some of the insects themselves, sticking about his clothes, or in his shoes, and thus remove them into a granary where none had ever been. Besides, the ship, waggon, or cart, employed to carry corn, may be infested with weevils, by having carried grain in which they abound, and thus from a few of these insects, multitudes may be produced by the ordinary course of generation.

"But, in order fully to investigate the truth of this, I desired the persons who had argued this matter with me, to bring me the first weevils they themselves should find, (it being then the winter season;) and on the 13th of March I received some grains of wheat (many of which had the insides eaten away) mixed with weevils.

"I took three glasses, in each of which I put six, eight, or nine, weevils, and eight, ten, or twelve, grains of wheat, which wheat I was the more assured could not be infested, because it had been kept for several months, closely covered up, in my study. In a fourth glass I put some weevils without any wheat; but this last mode of experiment I afterwards rejected, observing that in the space of twelve days they all died. As to the other three glasses, the weather being cold, and observing the animals, for the most part, to lie motionless, I put them into a leather case, which I always carried about me. And I had no doubt, but I should clearly prove to all, that the weevil proceeds from a maggot; for which reason I frequently examined these objects by the microscope.

"I, at first, entertained an opinion, that the weevil, like the silk-worm's moth, and many other insects, did not, while in that shape, take any food: but herein I found myself mistaken, and observed that

that the weevil not only feeds upon wheat, but that it can excavate or scoop out the whole contents of every grain, and creep about in the inside, being provided with a beak, or trunk of a great length, in proportion to the size of its body, at the extremity of which, are certain exceedingly small organs, or instruments like teeth, and with these it can bore or pierce through the outward husk or shell of the wheat, and thus open to itself a passage to devour the contents.

"At a fortnight's end, namely the 27th of March, I observed some of these weevils coupled together, and from this time I frequently inspected them, but saw no appearance of any living creature being produced from them until the 10th of June, when I observed lying among the weevils and the wheat, two short and thick little maggots, one of them about the size of a large grain of sand, and the other about one fourth part larger: seeing this, I opened one of the glasses in which I had enclosed six weevils, and examined the different grains of wheat that had been put in with them, and found two of them to be entirely hollow and empty; from another of the grains, which by the external appearance was the least eaten or consumed, but had many small perforations or little holes not discernible by the naked eye, I drew out a perfectly-formed weevil, which was of a yellow colour: whereas those which were at first brought to me, and had been shut up in the glass for three months, were of a deep red red, almost approaching to black.

"In another grain of the wheat I found a weevil, of a very pale or white colour, with its claws, horns, and beak, or trunk, lying close to its body, in exact order, as we see the wings and legs of a silk-worm's chrysalis or aurelia, when it is almost arrived at the state of a flying insect, only with this difference, that the unformed weevil is not inclosed in a shell or case, like the aurelia of a silk-worm. In other grains of the wheat I found maggots of different sizes; and from one grain I took out a perfectly formed weevil, whose white colour was changing to a red, and which was continually in motion.

"Examining the other glasses, I found some of the grains of wheat perforated with little holes, and others half eaten. Some of the weevils which had been shut up in these glasses I opened, and in one of the females I found five white eggs, which I conceived to be of their full size: in others I observed eggs, some of which were arrived to maturity, and others gradually less and less.

"Hence I concluded, that whereas the silk-worm's moth, living only a few days, in that time lays a multitude of eggs and then dies; on the contrary, the weevil, which every day produces but few eggs, is a long-lived animal, and by this means may be as prolific as silk-worms or other insects: for the weevils which I am now treating of were all alive the preceding summer.

"As to the two maggots which I at first found in the glass among the wheat, I had no doubt that they had fallen out of the grains wherein they had been first deposited, by reason that those grains had been rather too much eaten away before the eggs were laid in them, and the holes which had been made in them rather too large; and, as all creatures, however minute, are endowed with most admirable faculties and powers to answer the ends of their creation, I think it very probable that the large trunk or beak with which this insect is provided, (furnished with teeth or pincers, which open and shut in exact correspondence with each other,) is given to it of such
a length

a length that it may be enabled to bore a small deep hole in every grain of wheat, and therein deposit an egg, otherwise the maggots breeding from these eggs would never grow to maturity: for if a weevil were to lay its egg on the outside of a grain, and a maggot should be hatched from it, such a maggot could not possibly pierce the husk of the wheat. Again, were a weevil to lay more than one egg in one grain, and all these eggs produced maggots, they would hinder each other's growth, for want of having sufficient nourishment, inasmuch as one grain is not more than sufficient to nourish one maggot, and so to produce one weevil.

"I observed, in opening one grain in which a small hole had been made, and out of which I took one single egg, that round above that part where the egg was placed, the mealy substance of the wheat had been loosened or reduced to powder, from whence I concluded that the parent weevil, before it laid the egg, had, by means of its trunk, separated the particles of meal in that part, both to make a soft place for the egg to lie in; and also, that, when the minute maggot should creep out, it might find this soft and loosened meal prepared for its first feeding on.

"Some of these maggots I placed in glasses by themselves, and observed them gradually to assume the form of weevils, the beak, horns, and claws, appearing by degrees, and the colour also changing from a white to a yellow, and then to the red colour of the weevil.

"As I had observed, that none of these insects which were kept in glasses together with grains of wheat ever deposited their eggs on the glass, I put three females into a glass by themselves, and in the space of twenty-four hours they laid four eggs. In the space of seven days these eggs produced the kind of maggots before mentioned, which, when first hatched, were not larger than a grain of sand. This maggot was in continual motion, but, when a little at rest, it contracted its body together; and, when it attained to its full size, the shape remained the same until the time approached for its being changed into a weevil. These maggots have very little strength to move from place to place, so that it seems designed by nature, that they should be fed no where but in grains of corn: for, if a weevil were to deposit its egg in any place except in the inside of a grain, it would in my opinion be impossible for the maggot thence produced to procure any nourishment and become a perfect weevil.

"These things considered, we may be fully satisfied respecting the reason, why in corn, which is frequently moved and shifted, the weevil can encrease but little: for, supposing one of these insects to have pierced and prepared two or three grains ready to deposit its eggs, and soon afterwards the corn is moved or spread about, the animal, when it is ready to lay an egg, finding no grain prepared to receive it, must leave such an egg on the outside of the corn, where the young maggot, when hatched, will be in the same situation as seed sown in barren land; and consequently must perish. But, if such corn is undisturbed, the weevil may multiply in a great degree, by depositing its eggs in the grains fitly prepared for them, and which may be considered as so many nests for the reception of the young. Again, the long life of this insect causes it to multiply exceedingly, for the weevils which I received in the month of March (the youngest of which was undoubtedly a year old) were alive and vigorous in June following; and who can tell how long the natural life of this insect may be?

"I trust that these observations will prove that weevils cannot be produced otherwise than by propagation, that is to say, by copulating and laying eggs, from which eggs, maggots proceed; and finally those maggots are changed into weevils. But whether the vulgar will be hereby convinced of the error of their opinion in this respect, I much doubt, being continually pestered with their objections to what I have advanced. It is, however, with me, a most certain truth, that what I have demonstrated respecting the weevil, namely, 'that it cannot be produced otherwise than by generation, does also hold good with regard to all creatures endued with life and motion.' And, although this is a very minute animal, yet its species must have been continued in the way I have laid down, from its first being formed at the creation: and were it otherwise, namely, that from inanimate matter, such as stones, wood, earth, plants, or seeds, this or any other animal should be produced, that would be a departure from the general course of nature; and such formation, or new creation, must be continually derived from the supreme almighty Creator.

"Probably what I here advance may appear strange to some, and they may perhaps wish me to enquire into the propagation of other minute animals; but for the present, I leave the prosecution of these matters to those who may choose to bestow as much labour thereon as I have done in this examination of the weevil, assuring them that my observations are the result of more than four months application to the subject."

[To be continued occasionally]

ACCOUNT OF DR. WILLIAM HERSCHEL.

DR. William Herschel is a native of Hanover, and was born November 15, 1738. He was the second of four sons, all of whom were brought up to their father's profession, which was that of a musician. In addition to these, Mr. Herschel, senior, had two daughters; and therefore, burdened with so large a family, and in a poor country too, it is not at all a matter of wonder that the education which he bestowed on his children was but scanty. Finding, however, in William a lively and inquisitive genius, beyond what appeared in the other sons, he gave him the advantage of a French master, under whom he made a rapid progress in the attainment of that language. Luckily, the tutor had a metaphysical head, and so fond was he of his favourite study, as well as those branches of science which are connected with it, that he was desirous of making his pupil acquainted therewith. From this worthy man, young Herschel gained a tolerable knowledge of logic, ethics, and metaphysics; and his attainments therein excited in his mind a strong and insatiable thirst for learning, with the commendable resolution of exerting himself to the utmost to improve his stock of intellectual treasures. These, indeed, were all his inheritance, except a musical instrument, and some manuscript music. With this store, unpromising as it was, our adventurer bade adieu to his native country while the flames of war were spreading around it, and arrived in London in the year 1759. Here he was lost in the crowd of candidates for employment; and, we may well suppose that his situation in a strange country, without friends, and in but indifferent circumstances, must have been both painful and irksome. Mr. Herschel had

had not only a steady but a virtuous mind. Hereby he was enabled not only to bear up with fortitude against disappointments, but to persevere with alacrity in improving himself in an occupation, which hardly seemed to promise him a comfortable subsistence.

Finding but little prospect of succeeding to his wish in the metropolis, he prudently resolved upon going into the country; where, musical professors being few, the chance of success must be the greater. After visiting different places in the north of England, his good fortune brought him to Halifax, where, an organist being wanted, his merits were tried, and he procured the appointment. Here he also taught music with approbation and profit. The love of learning still prevailed, and at this place he devoted his spare hours to the study of the languages, beginning with the Italian, on account of its intimate connection with his profession. From the Italian he proceeded to the Latin, in which he made an eminent progress. He then attempted the Greek, but after a little application he abandoned the study of this language, considering it as too dry and abstracted for his purpose.

In these pursuits Mr. Herschel was entirely self-taught; and he holds out, in consequence, an excellent and pertinent example to those young persons whose education has been circumscribed within common limits, through the penury or narrow-mindedness of of their friends.

A determined heart, and persevering application, we see, from this instance, will overcome obstacles that are apparently insurmountable.

But it was not to the dead and living languages only that Mr. Herschel bent his ardent and resolute mind. He attempted to gain a knowledge of the most abstruse sciences. His first effort was to make himself master of the theory of harmonies; and it is observable, that the book which he made choice of for this purpose, was no other than the profound and intricate treatise of the learned Dr. Smith upon that subject. He got through this work, however, without any assistance; and, so great was the pleasure which he derived from it, that he resolved upon studying the other branches of mathematical learning. He began with algebra, which he soon mastered; thence he proceeded to Euclid, and so on to fluxions. The ground-work being thus laid, the study of the other sciences became easy.

His situation at Halifax was favourable to his grammatical and mathematical pursuits; and it is well, that he thus laid in a thorough stock of sound knowledge in what may be called his retirement. In 1766 he exchanged this place for one of a very different description, being elected organist to the octagon chapel at Bath. Here he entered at once upon a great round of professional business, performing at the rooms, theatre, oratorios, and public and private concerts, besides having a great number of pupils. In such a hurry of employment, and in the immediate circle of luxury and amusement, very few men of Mr. Herschel's profession and age would have found time to pursue studies seemingly so unprofitable and uninteresting as mathematics.

So far, however, from relaxing in his scientific studies, he pursued them with increasing ardour, and after a day of hard labour, he commonly retired at night to his mathematical books, and spent

many hours in an unwearied attention to the most abstruse questions in geometry and fluxions.

In the Ladies' Diary, for 1780, appeared an elegant and profound answer by him to a very difficult prize-question, respecting the vibrations of a musical chord loaded in the middle with a small weight.

About this time his studies were chiefly directed to optics and astronomy. The pleasure which he had experienced from viewing the heavens through a two-feet Gregorian telescope, which he borrowed at Bath, made him desirous of possessing a complete set of astronomical instruments. His first object was to get a larger telescope; and, being ignorant of the price at which such instruments are usually charged, he desired a friend in London to buy one for him. This gentleman, surprised at the sum demanded for the telescope, declined purchasing it till he had informed Mr. Herschel of the circumstance. Our astronomer's astonishment was equal to that of his friends; but, instead of dropping his pursuit, he formed what many would have regarded as a most romantic resolution, that of making a telescope for himself. He did not content himself with a speculative idea, but, from the scanty instructions he could gather out of optical treatises, actually set about this arduous undertaking. Disappointment succeeded disappointment; but all this only served to act as a stimulus to his ardent mind, and at length his perseverance was crowned with success, and, in 1774, he enjoyed the exquisite satisfaction of beholding the heavens through a five-feet Newtonian reflector of his own workmanship. Our modern Galileo did not rest at this attainment, great as it was, but, with a laudable ambition, set about making instruments of a greater magnitude than had hitherto been known. After constructing those of seven, and even ten feet, he thought of forming one not less than double the latter size. So great was his patience, so determined his perseverance, that in perfecting the parabolical figure of a seven-feet telescope, he did not make less than two hundred specula before he obtained one that would bear any power that was applied to it.

While he was thus laboriously employed in his mathematical pursuits, he did not neglect the immediate duties of his profession. Yet so much did his new occupation engage his mind, that he has frequently stolen from the theatre or the concert-room to look at the stars, and then return again in time to bear his part among the musical performers. This constancy to Urania was at length most bountifully rewarded, by the discovery of a new planet in our system, to which he gave the name of *Georgium Sidus*, but which foreign astronomers have generally termed *Herschel*.

This important discovery was made in the night of the 13th of March, 1781. It was by no means a mere accidental circumstance which favoured our astronomer with the view of this planet; but the result of a regular, patient, and scientific, chain of observations. When he first saw it, he was not quite certain that it belonged to our system; but a closer enquiry enabled him to ascertain with exactness its planetary disk, as well as its motion.

This discovery was communicated the same year to the royal society; and in consequence of it, Mr. Herschel was unanimously elected a member, and had the annual gold medal bestowed upon him for his service to the interests of science.

The year following his majesty took him under his immediate patronage,

tronage, and constituted him his astronomer, with a handsome pension. On this he quitted Bath and his musical instruments; and went to live at Slough near Windsor, at a house appointed for him by his royal master.

Here he was enabled to carry on his projects with vigour, and those which had hitherto failed of success were now brought to perfection. While at Bath, he had formed the bold scheme of constructing a telescope of thirty feet, and actually made several trials to carry his object into effect. But, though he failed there, since his residence at Windsor he has far exceeded this design, and completed an instrument of no less than forty! The irregularities in the speculum, and the impossibility of rendering the parts of so enormous an instrument as this mathematically exact, have hitherto prevented his being able to make any actual observations with it. It is a vulgar error, that the discoveries of Dr. Herschel have been occasioned by the enormous magnifying power of his telescope; the fact is, that no such large power is necessary, or useful; and that all Dr. Herschel's discoveries have been made with reflectors of from ten to twenty feet, and with powers of from sixty to three hundred. His discoveries are to be ascribed to his laudable perseverance, and not to the size of his great telescope, which is rather an object of curiosity than of utility.

In 1783 he discovered a volcanic mountain in the moon, and in 1787 made farther observations upon that planet, and found two others therein, which emitted fire from their summits. In prosecuting his enquiries respecting his own planet, (if we may be allowed so to express ourselves,) he has discovered it to be surrounded with rings, and to have six satellites.

For all these important additions to the stock of national knowledge, our astronomer had the honour of receiving from the university of Oxford the degree of a Doctor of Laws; which is the more creditable, as that learned body is very sparing of its academic honours upon persons who have not been educated within its walls.

Dr. Herschel has been a regular contributor to the Philosophical Transactions ever since his first communication in 1781, respecting his discovery of the new planet. Some of his papers are extremely curious; and he has hazarded a few bold conjectures respecting the sun, and other planetary bodies, which would hardly have been received from a less accurate observer.

In his astronomical pursuits the doctor is materially assisted by his sister, Miss Caroline Herschel, who has distinguished herself greatly by her application to this sublime study, and has communicated to the Royal Society some very ingenious reports of observations made by her upon the starry orbs.

Dr. Herschel is a man of unassuming manners, a free, communicative, and pleasant, companion; and enjoys that vigour of constitution which is so essential to an astronomical observer in a climate like that of England. It may be hoped, that his name will endure as long as the planetary system, to illustrate which he has devoted his life.

DESCRIPTION OF HAMBURGH.

THIS city, which particular circumstances have of late brought forward on the political canvas, is one of the most considerable in the northern part of Europe. There is not an instance of one, whose

whole commerce and population have increased so much within the space of ten years. According to the official report, it has 130,000 inhabitants. For a long time the population of Copenhagen has been compared to that of Hamburgh; but we now have certain knowledge, that the first of these towns has not more than 83,000 inhabitants.

Hamburgh has become the depot of European commerce since the decline of Amsterdam; it is well known, that a great number of merchants have resorted thither from different parts of Europe, taking their property along with them. To judge of the extent of its commercial concerns, we have nothing to do but to acquaint ourselves with the quantity of imports in the course of the last year. In the article of coffee alone, there were not less than forty-six millions of pounds, almost the whole of which came from English and American ports, viz. from Liverpool 10,073,000; from London 4,568,000; from New York 4,182,000; from Philadelphia 5,773,000; from Baltimore 8,965,000; and what is remarkable, from the island of St. Thomas 4,162,000 pounds; the importation of sugar amounted to 98,000,000 of pounds, which also came chiefly from the English and the Americans. The number of vessels which entered the port of Hamburgh was 2148; of which three only came from Cadiz; 117 from Amsterdam; 198 from London; 80 from Newcastle; 51 from Bourdeaux; 71 from Russia; two from China; and 149 from the United States of America.

Hamburgh dispatched seventeen vessels in the whale fishery, and it turned out remarkably well. To make the matter clearer by comparison, we shall add, that in the course of the same year only 1901 vessels arrived in the port of Amsterdam; of which 279 came from Bremen, two from Cadiz, fifteen from Bourdeaux, forty-two from London, 711 from Hamburgh, &c.

So extensive a trade must necessarily have brought about a remarkable change in the manners, customs, and taste, of the people of Hamburgh. The mode of living, for example, is very different from what it was ten years ago. You find in almost every quarter of the town French *restaurateurs*, the greater part of them gentlemen under the old regimen, men of principle who have preferred this manner of earning a subsistence to others less honest. At these houses you are served exactly in the French manner, and by French servants; and some of them are distinguished at the same time by a cleanliness truly English.

The entertainments at Hamburgh are sumptuous; and the tables are spread with the choicest viands. On the other hand, in private their family dinners are prepared with a frugality becoming men who are skilled in calculation. What renders a residence at Hamburgh most agreeable is, that every one may live there as he pleases. The Englishman, for instance, will find plenty of private houses, where they live in the style of his country and speak the language; the same with the Frenchman, and most other nations. In this city there are not only inns, according to the English fashion, but even chop-houses (a sort of English ale-house, says the foreign writer of this article).

Robberies are very rare; and this is certainly owing to the general competency and good morals of the place. Very seldom does one hear of a murder. There are but few quarrels in the streets,

streets, and it is not common to meet persons in a state of intoxication. There is, perhaps, no town where it is so much the custom to make excursions on Sundays into the country. Every family, in the least degree opulent, has a country-house. They commonly leave the city on a Saturday afternoon, and return on Monday morning; and they either take a party of friends with them, or receive their visits at their villas on Sunday. The inferior classes on this day fill the taverns and public-houses, which are very numerous; at some they dance, at others they play at skittles; and at all these, a pipe is a favourite recreation.

It is surprising, since Hamburg is so greatly increased, that they have not yet resorted to the accommodation of hackney-coaches; there is not even a carriage, in the nature of an English stage-coach, to carry persons backward and forward at certain hours between Hamburg and Altona, Wandsebeck, &c. though such an establishment would certainly answer well to those who might have sufficient enterprise to set it on foot.

At Hamburg we see perpetually new buildings, though building is not in general the rage of the Hamburgers. They build because they find it necessary. The price of houses has increased within a few years, 50, nay 100 per cent. At present they are no longer on the rise, the political horizon having become too cloudy, and discontents having increased, with the interest of money, to an unprecedented degree.

The gates of the city are shut very early; a circumstance much complained of by strangers and people of fortune. It is, however, wrong to censure this prudent regulation of the senate. It is compensated by considerable advantages, and there are few great cities in which the inconveniencies and restraints are not much greater.

The Exchange is a sorry building, and far too small. In looking at it, one is reminded of the answer of the Chancellor Bacon to Queen Elizabeth, who, expressing to him her wonder at the smallness of his house, was told, that the house was not too little for him, but her majesty had made him too great for his house. Thus has the trade of Hamburg become too extensive for its exchange.

All must agree, that the country on the borders of the Elbe affords a most enchanting view. The houses situated on its banks are built, some in a very superb, others in a very neat, style. They are furnished in such a manner as one might expect from rich merchants, men, too, familiarized with English manners, whose commerce, conveniencies of life, and luxuries, are superior to those of all other nations. The public gardens, which surround the city, are in general kept in good order, particularly that of Harvesstehede on the Alster, about a league from Hamburg. It not only affords a picturesque scenery, beautiful walks, and shady seats, but it has the farther attraction, that you may go to it by water. It is accordingly much frequented in the summer season.

It is rare, perhaps singular, to find three large towns so close to each other as Hamburg, Altona, and Wandsebeck; they are not merely contiguous, but actually touch each other. Altona is a spacious town, carries on a considerable commerce, has a theatre, &c. Many distinguished characters, particularly *literati*, have chosen that city for their abode; and several persons reside there who have acted a very conspicuous part in the French revolution.

EFFECTS OF CLIMATE ON THE ENGLISH CHARACTER.

A DISTINGUISHABLE characteristic of the climate of this island is, its very great variableness, and a considerable degree of humidity. Winds, from whatever quarter they blow, bring with them rain; and in the fairest days it is very seldom that the air is not loaded with vapours, more or less perceptible. We are every where enveloped in a fog; and, of all the countries I have ever travelled in, never did I find fogs so frequent, or so thick and heavy. This is surely the land of mists and vapours; and, were it not for high winds which every now and then sweep and dry the earth, it would be constantly damp and wet; for it is easy to imagine that the rays of the sun, having to force a passage constantly through such a dense atmosphere, must be greatly weakened in power and activity. I will not say, with the Marquis de Caraccioli, that the brightest sunshine in England is not equal to the brilliancy of a moonlight night in Naples: it is, however, very certain, that the sun appears very seldom in his full splendour: for, when you suppose you are going to enjoy the comfort of his beams, he is, in a moment after, hid from you by impenetrable clouds; and, in general, for whatever cause I know not, except it be a peculiar predilection for the immortal Newton and his disciples, nature appears to be here more lavish of brilliant nights than fair days. Young, so harshly apostrophized by Le Mierre, in his *Fastes*; this Young, I say, "the nightwalker, eager to see the setting sun," considering the partial distribution of day and night in his country, had more reason for hating day-light than is generally believed.

I am sensible that these remarks apply rather to London than other parts of England. The immense consumption of sea-coal increases the quantity of fog, thickens it, and renders it of longer duration, and, moreover, causes these mists to be more gloomy and suffocating. I am never so much incommoded as at the moment I rise from my bed. To breathe the fresh air of the morning is a sort of luxury which is not to be enjoyed in this noble large city; it is a poetical fancy, conceived, like other felicities of the Golden Age, in the brain of the writers of eclogues. I am of opinion, that it is from being deprived of this enjoyment, that we may account for the habit so common with the English, of rising later than we are accustomed to do. They will endeavour to persuade you here, that these exhalations being impregnated with nitre and sulphur, are so far from being prejudicial, that they neutralize the fogs, purify the air, and preserve it in a proper degree of temperature. This may possibly be, but it is very certain they render the atmosphere thicker, and more dark and heavy, and perceptibly charge the air you breathe with a very disagreeable black smoke.

As a proof that the climate throughout England does not greatly differ from that of London, except in the circumstance just before mentioned, we may instance the nature of its produce. By an excellent mode of cultivation, the land is made to produce the best of corn, and in such abundant crops that one year's harvest is sufficient for the consumption of fourteen months; the pasturage is rich; potatoes are superior to any grown in France, and hops are very good; but grapes, and all the fruits and pulse which owe their perfection

to the genial influence of a warm sun, are not to be had ; it is only by mere dint of art that they are raised ; and their vegetation being factitious, they have rather the resemblance than the reality of what they are called. It is very easy to discover the great labour and painful industry which luxury employs in effecting this imposition upon itself ; it is Vulcan endeavouring to get the better of Apollo, and it must be confessed, the gods themselves are apt to fail whenever they attempt any thing out of their province.

A sky in which no cloud is to be seen, is so great a novelty, that it takes place of all other news ; and it is impossible for a foreigner not to remark the joyful congratulations which he hears on all sides, when the sun condescends to shew himself ever so little—"A very fine day—very fine weather, indeed !"

Is it not from the uncommonness of fine weather in England that the country has produced so many good poets and so few painters of excellence ? Nature is rarely seen there in her best dress. How much more sensible and lively then must the imagination prove ? Nature, in the perfection of her charms, is a mistress only seen in this island for a short time, and, as it were, in secret ? In other countries, as in Switzerland, Italy, and in the southern parts of France, she is a wife, and her beauty is less thought of and admired. Lively impressions may form a great poet, but they will not make great painters. Because it is not enough that the painter is strongly charmed, but he must copy nature with the pencil in his hand ; he requires the advantage of time for observation ; he must consider his model at leisure ; he must have serene weather to view it in, and a perfect daylight to see clearly every object of his imitation ; it is only under a clear sky that colours appear in their full truth and lustre.

If you were told of an island in a certain latitude, in which the winds were extremely variable, the climate rather temperate, but the air almost continually loaded with fogs and watery mists ; if you were farther informed, that the inhabitants of this island, after having, by their labour and industry, acquired a competency, indulged in habits which induced a necessity for an abundant diet ; that, indeed, they consumed little bread, an aliment which is easily changed to chyle, but a great deal of flesh, much butter, and large quantities of potatoes, and that their constant beverage was a strong beer of a peculiar fattening quality, and in which a little opium was infused ; would you not be inclined to pronounce, that with such a regimen, in such a climate, the men must, in general, have much bodily substance, and materials for life and reproduction, and, in many respects, great strength and vigour for action, and the support of labour and hardships ; but that for the most part their fibres must be soft and flaccid, and consequently without elasticity and feeling ; and that, with a few exceptions, their animal spirits were dull, and circulated but slowly ? Well, now, what you would presume, I think I have seen.

The English caricatures always picture a Frenchman lean and half starved ; and it cannot be denied but that the English, in general, have the appearance of being far better fed. This does not altogether proceed from their eating more, but from the difference of the aliments which the one and the other nation accustoms itself to. There is more gross and elementary matter in the English diet ; ours is at the same time less heavy, and of a more bracing quality, consequently

quently it must more easily cherish the warmth of the vital principle, and accelerate the circulation of the blood. It is impossible but from excess of the former regimen there must be produced in the moral character a greater degree of heaviness, indolence, and melancholy; and, by abuse of the latter, much gaiety, folly, and precipitance.

Is not the disease to which the English are particularly subject, and which has passed to other nations by the name they have given it, *the spleen*, a plain proof of the twofold effects of their diet and climate? Do but ask our friend Montaigne, whether constantly to look up to a sky obscured with clouds and vapour, will not dispose the mind to gloomy thoughts, and melancholy ideas?

As a relief from the anxiety and languor, the natural consequence of the mode of living I have described, the English are under the necessity of having recourse to various means, which are not without many inconveniences. They drink a great deal of tea; this certainly helps digestion, and dissolves the humours by helping them in their passage, but it increases perspiration, and brings on relaxations of the nervous system. Another means made use of, still more dangerous, is the immoderate quantities of the strongest wines, and the most fiery spirits. Gin and brandy are the regale of the lower sort of people, and the women of this class are not less addicted to drinking these liquors than the men.

From these meteorological and dietetic remarks, I wish to draw a conclusion which, in my opinion, will fully explain why the characteristic of the English is that of method and steadiness, with less restlessness and more seriousness than we appear to possess; an activity less lively than ours, but more sedate; a degree of mirth less natural than with us, but not so easily excited, nor so violent in its paroxysms; a temper of mind less volatile, but more solid and profound; feelings less discoverable and active, but stronger and more just. If an Englishman begins to act, he does it after reflection, and a full examination. His moments of mirth and jollity convey the idea of that sort of delirium attendant on the attacks of a feverish disorder. Who is there in France without wit and humour? I will freely pronounce that the very fools and idiots are not without it. But here, though the people in general think properly and justly on all occasions, you find but few who are possessed of wit, except some men of talents, who, by an assiduous attention, have opened the stores of ingenuity. Wit is not here a parasite plant, the spontaneous production of the land; it springs up only where it has been carefully planted in a soil properly prepared to receive it. There is, if you will permit me the remark, less wit and humour in England than in France; but what is found here is more original, and better digested; there are fewer false pretensions to a refined understanding here; it is here, too, less common to apply it to an improper use; and it is not, as in some other places, a general received opinion, that wit can make up for all deficiencies, and that, with it, decided opinions may be given on all matters without study or the least previous acquaintance with the subject. *Meister's Letters.*

STATE OF THE POOR.

IT is much to be lamented, says Mr. Colquhoun, that in this metropolis the magistrates interfere very little in parochial relief, except when appeals are made to them in particular cases, or when called

called upon to sign orders of removal, which is generally done as a matter of course. Hence it is that the poor are left almost entirely to the management of the parochial officers for the time being, who frequently act under the influence of ignorance or caprice, or are irritated by the impudent importunity of the profligate gin-drinking poor. These officers also, it is to be remembered, have private affairs which necessarily engage the chief part of their attention; and, are frequently no less incapable than unwilling to enter on those investigations which might enable them to make the proper discriminations: the modest and shamefaced poor are thus frequently shut out from relief, while the vociferous and idle succeed in obtaining pecuniary assistance, which is soon improvidently dissipated.

The distress which is thus shewn to prevail, by no means arises from the want of competent funds:—the misfortune is, that from the nature of the present mode of management it is not possible to apply these funds beneficially for the proper relief of those for whom they were intended. A much more moderate assessment, under a regular and proper management, would remove great part of the evil.—The expence of the class of persons denominated casual poor, who have no settlement in any parish in the metropolis, amounts to a large sum annually.—In the united parishes of St. Giles's in the Fields, and St. George's, Bloomsbury, this expence amounted to 2000*l.* in the year 1796. It arose from the support of about 1200 poor natives of Ireland; who, but for this aid, must have become vagrants. The shocking abuse of the vagrant passes previous to the year 1792, produced the act of the 32d Geo. III. cap. 43, which requires that vagrants should be first publicly whipt, or confined seven days in the house of correction, (females to be imprisoned only, and in no case whipped,) before they are passed, as directed by the act of the 17th Geo. c. 5. Hence it is, that so many who are either on the brink of vagrancy or have actually received alms, are permitted to remain a burthen on the parishes; the magistrates being loth to incur the charge of inhumanity, by strictly following the letter of the act, in whipping or imprisoning poor miserable wretches, whose indigence has rendered relief necessary.

In all the 146 parishes within and without the walls, including the bills of mortality, &c. it is not improbable that the casual charity given in this way may amount to 10,000*l.* a year.

The loose manner in which it is given, and the impossibility either of a proper discrimination, or of finding, in the distributing these resources, that time for investigation which might lead to the solid benefit of the pauper, by restoring him to a capacity of earning his own livelihood, makes it highly probable that instead of being useful, this large sum is, perhaps, hurtful, to the major part of the poor who receive it. The trifle they receive, from being injudiciously given, and frequently to get rid of the clamour and importunity of the most profligate, is too often spent immediately in the gin-shop. No time can be afforded for an enquiry into the circumstances of the family—no measures are pursued to redeem their apparel locked up in the pawnbrokers' shop, although a small sum would frequently recover the habiliments of a naked and starving family—no questions are asked respecting the means they employ to subsist themselves by labour; and, no efforts are used to procure employment for those who are willing to labour, but have not the means of obtaining work.

Hence it is that poverty, under such circumstances, contributes in no small degree to the multiplication of crimes. The profligate, thus partly supported, too often resort to pilfering pursuits to fill up the chasm; and, habits of idleness being once obtained, labour soon becomes irksome.

Why should not the whole nation, but particularly the metropolis, be considered, so far at least as regards the vagrant and casual poor, as one family, and be placed under the review of certain persons who might be considered as worthy of the trust, and might devote their time sedulously to that object? Were such an establishment instituted, and supported in the first instance by a sum from each parish, equal to the casual relief they have each given on an average of the five preceding years, with power to employ this fund in establishing houses of industry, or work-rooms, in various parts of the metropolis, where the poor should receive the whole of their earnings and a comfortable meal besides:—it is highly probable, that, while the expence to the parishes would gradually diminish, beggary would be annihilated in the metropolis—the modest and deserving poor would be discovered and relieved, while the idle and the profligate, who resorted to begging as a trade, would be compelled to apply to honest labour for their subsistence.

This is a point in the political economy of the nation highly important, whether it relates to the cause of humanity or to the morals of the people, upon which all good governments are founded.—That such an institution is practicable is already proved from the partial experiments that have been made. That the advantages resulting from it would be great beyond all calculation, is too obvious to require elucidation. No new buildings would be necessary for this purpose:—abundance of old houses could be hired in different parts of the town at a moderate expence.

The system which prevails in the metropolis, with respect to those unfortunate individuals who are denominated the casual poor, will be found, on minute enquiry, to be none of the least considerable of the causes which lead to the corruption of morals, and to the multiplication of minor offences.

The number of persons, who with their families find their way to the metropolis, from the most remote quarters of Great Britain and Ireland, is inconceivable. In hopes of finding employment, they incur an immediate and constant expence for lodging and subsistence, until at length their little all is in the pawnbrokers' shops, or sold to raise money for the necessaries of life. If they have been virtuously brought up in the country, despondency seizes upon their minds in consequence of the disappointments and hardships their adventurous or incautious conduct has doomed them to suffer; which, as it applies to the most deserving of this class, who will not steal, and are ashamed to beg, often exceeds any thing that the human mind can conceive.

Their parochial settlements are either at a great distance, or perhaps they are without even this resource. The expence of removing, as the law directs, is too serious a charge to be incurred by the parish where accident has fixed them. Under such circumstances their applications are too frequently treated with neglect and contumely by the parochial officers; and, from the disappointment they thus experience, they are not seldom driven to despair. Willing to labour,
but

but bereft of any channel or medium through which the means of subsistence might be procured, their distresses become exceedingly severe. It is assigned to no person to hear their mournful tale; who might be able to place them in a situation where they might gain a subsistence; and, under such circumstances, it is much to be feared, that not a few of them either actually perish for want, or contract diseases which ultimately terminate in premature death.

Such is frequently the situation of the more decent and virtuous class of the labouring people, who come to seek employment in the metropolis. The more profligate, who pursue the same course, have generally other resources. Where honest labour is not to be procured, they connect themselves with those who live by petty or more atrocious offences, and contribute in no small degree to the increase of the general phalanx of delinquents. The young female part of such families too often become prostitutes, while the males pursue acts of depredation upon the public, by availing themselves of the various resources which the defects in the police system allow.

It is to be lamented, that in contemplating the mass of indigence, which, in its various ramifications, produces distresses more extensive and more poignant than, perhaps, in any other spot in the world (Paris excepted), its origin is to be traced in almost every rank of society; and, though sometimes the result of unavoidable misfortune, is perhaps more frequently generated by idleness, inattention to business, and indiscretion. But, at all events, the tear of pity is due to the helpless and forlorn offspring of the criminal—the indiscreet or indolent, who become objects of compassion, not only as it relates to their immediate subsistence, but much more with respect to their future situations in life. It is in the progress to the adult state, that the infants of parents, broken down by misfortunes, almost unavoidably learn, from the pressure of extreme indigence, to resort to devices which early corrupt their morals, and mar their future success and utility in life. Under the influence of these sad examples, and their necessary consequences, do many females become prostitutes, who, in other circumstances might have been an ornament to their sex; while the males, by contracting early in life habits that are pernicious, become, in many instances, no less noxious to society. Familiarized in infancy to the pawnbroker's shop, and to other even less reputable means of obtaining temporary subsistence, they too soon become adepts in falsehood and deceit. Imperious necessity has given an early spring to their ingenuity. They are generally full of resources, which in good pursuits might render them useful and valuable members of the community; but unhappily, their minds have acquired a wrong bias, and they are reared insensibly in the walks of vice, without knowing, in many instances, that they are at all engaged in such pursuits.

In all these points of view, from indigence is to be traced the great origin and the progress of crimes.

The poor may be divided into five classes.—The first class comprehends what may be denominated the useful poor, who are able and willing to work—who have already been represented as the pillars of the state, and who merit the utmost attention of all governments, with a direct and immediate view of preventing their poverty from descending unnecessarily into indigence. As often as this evil is permitted to take place, the state not only loses an useful subject,

but the expence of his maintenance must be born by the public. The great art, therefore, in managing the affairs of the poor, is to establish systems, whereby the poor man, verging upon indigence, may be propped up and kept in his station. Whenever this can be effected, it is done upon an average at one-tenth of the expence, at most, that must be incurred by permitting a family to retrograde into a state of indigence, where they must be wholly maintained by the public, and where their own exertions cease, in a great measure, to be useful to the country.

The second class comprehends the vagrant poor, who are able but not willing to work, or who cannot obtain employment in consequence of their bad character. This class may be said to have descended from poverty into beggary, in which state they become objects of peculiar attention, since the state suffers not only the loss of their labour, but also of the money which they obtain by the present ill-judged mode of giving charity. Many of them, however, having become mendicants more from necessity than choice, deserve commiseration and attention; and nothing can promote, in a greater degree, the cause of humanity, and the real interest of the metropolis, than an establishment for the employment of this class of indigent poor, who may be said at present to be in a very deplorable state, those only excepted who make begging a profession. It is only by a plan, such as has been recommended, that the real indigent can be discovered from the vagrant, and in no other way is it possible to have that distinct and collected view of the whole class of beggars in the metropolis, or to provide the means of rendering their labour (where they are able to labour) productive to themselves and the state. And it may be further added with great truth, that in no other way is it possible to prevent the offspring of such mendicants from becoming prostitutes and thieves.

If, therefore, it is of importance to diminish crimes, and to obstruct the progress of immorality, this part of the community ought to be the peculiar objects of a branch of the national police, where responsibility would secure an accurate execution of the system. This measure ought to begin in the metropolis, as an experiment, and when fully matured might be extended with every advantage to the country.

The third class may be considered under the denomination of the indigent poor, who from want of employment, sickness, losses, insanity, or disease, are unable to maintain themselves.

In attending to this description of poor, the first consideration ought to be to select those who are in a state to re-occupy their former station among the labouring poor: and to restore them to the first class as soon as possible, by such relief as should enable them to resume their former employments, and to help themselves and families. Where insanity, disease, or infirmity, actually exist, such a course must then be pursued as will enable such weak and indigent persons, while they are supported at the expence of the public, to perform such species of labour, as may be suited to their peculiar situations, without operating as a hardship, but rather as an amusement. In this manner it is wonderful how productive the exertions of even the most infirm might be rendered. But it must be accomplished under a management very different, indeed, from any thing which prevails at present.

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The fourth class comprehends the aged and infirm, who are entirely past labour, and have no means of support. Where an honest industrious man has wasted his strength in labour, and endeavours to rear a family, he is well intitled to an asylum to render the evening of his life comfortable. For this class the gratitude and the humanity of the community ought to provide a retreat separate from the profligate and vagrant poor. But, alas! the present system admits of no such blessing. The most deserving must submit to an indiscriminate intercourse in workhouses with the most worthless; whose polluted language and irregular conduct, render not a few of those asylums as great a punishment to the decent part of the indigent and infirm as a common prison.

The fifth class comprises the infant poor, who from extreme indigence, or the death of parents, are cast upon the public for nurture. One-fifth part of the gross number in a London workhouse is generally composed of this class. Their moral and religious education is of the last importance to the community. They are the children of the public, and, if not introduced into life under circumstances favourable to the interest of the state, the error in the system becomes flagrant. Profligate or distressed parents may educate their children ill; but, when those under the charge of public institutions are suffered to become depraved in their progress to maturity, it is a dreadful reproach on the police of the country; and yet what is to be expected from children reared in workhouses, with the evil examples before them of the multitudes of depraved characters who are constantly admitted into those receptacles? Young minds are generally more susceptible of evil than of good impressions; and hence it is, that the rising generation enter upon life with those wicked and dangerous propensities, which are visible to the attentive observer in all the walks of vulgar life, in this great metropolis.

The principle of the statute of the 43d of Elizabeth respecting the poor laws, is certainly unobjectionable; but the execution, it must be repeated, is defective. No part of it has been effectually executed, but that which relates to raising the assessments. It is easy to make statutes; but, omnipotent as parliament is said to be, it cannot give talents, knowledge, education, public spirit, integrity, and time, to those changeable agents whom it hath charged with the execution of these laws.

In the management of the affairs of the state, the sovereign wisely selects men eminent for their talents and integrity. Were the choice to be made on the principle established by the poor laws, the nation and government could not exist even a single year.

In the private affairs of life, the success of every difficult undertaking depends on the degree of abilities employed in the management. In the affairs of the poor, the most arduous and intricate that it is possible to conceive; and where the greatest talents and knowledge are required, the least portion of either is supplied. How then can we expect success?

SOUP ESTABLISHMENTS.

At the present interesting crisis, when the high price of bread occasions a peculiar pressure upon the labouring people, every expedient which can, in any degree, tend to diminish this pressure, becomes an important consideration. Whatever, therefore, can be
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devised, or whatever has been already successfully carried into execution, for the purpose of diminishing the consumption of bread-corn, ought to be as fully and correctly stated, and as generally disseminated, as possible.

Among the various expedients which experience has shewn to be best adapted to afford substantial relief, none seems to deserve so much attention as soup establishments. These excellent institutions, which have existed in the metropolis for more than two years, have incontrovertibly proved how much can be attained in economizing the food of man, by the necessary preparation of meat and vegetables upon a large scale, in all instances where a design of this nature is properly methodized, and conducted with attention and regularity.

In the course of the two last seasons, namely, the winter and spring of 1798 and 1799, although no particular pressure then existed, no less than 1,232,254 meals or Winchester pints of soup were delivered to the poor at the soup-houses situated in Spitalfields, Clerkenwell, Southwark, and Westminster; and for which, they paid an aggregate sum amounting to 2567l. 4s. 9d. being at the rate of one halfpenny a meal, which is as near as possible the half of the first cost, including the contingent and incidental expences.

The unparalleled success of these useful establishments, thus clearly manifested by attaching the lower classes of the people to a cheap, substantial, and wholesome food, is none of the least of the advantages which have resulted from this frugal and beneficial mode of relieving the poor. The numerous applications of the labouring poor, particularly at Spitalfields, has not only occasioned an increase of boilers of very large dimensions at most of the old establishments, but has also excited a general disposition among the benevolent and humane to erect new soup-houses in every part of the metropolis, and also in the villages in the neighbourhood: and it is not doubted, when the whole of the proposed new institutions are sufficiently prepared to issue soup, that above 40,000 meals or pints will be delivered daily to the poor, at half price.

A relief so salutary and extensive, and offered (in proportion to the number of persons who will be thus fed) at so very inconsiderable an expence, cannot be too highly estimated, since it is evident that through this medium the means are at length discovered of effectually assisting the poor in severe seasons when the necessities of life are high, in a manner by which the benevolence of the opulent and humane embraces a wider field and extends infinitely beyond what the most sanguine mind could have conceived to be possible: since a single guinea subscribed, actually affords a hearty meal to 504 persons and that too of food, which, from its nourishing quality, strength, and thickness, cannot be considered as an improper substitute for bread, the consumption of which must unquestionably be diminished wherever this aliment forms a part of the food of a labouring man's family.

Where this has already been the case, some of the individuals benefited by the institution, have acknowledged an actual saving of 3s. 6d. to 5s. a week, a sufficient sum in itself to provide for the unavoidable wants of the poor, arising from the advanced price of bread and other necessities of life.

The advantages resulting from the soup-houses in the metropolis being thus explained, it may be necessary to state, that their success is alone to be attributed to the unwearied gratuitous attention of their conduc-

conductors, who, in systematizing these designs and extending their benefits in a manner not only to feed, but also to improve the habits, and, in some degree, the morals, of so great a portion of the labouring people, have felt themselves amply rewarded and gratified by the thankfulness universally expressed for the boon.

Our anxiety to extend the number of these beneficial establishments induces us to insert some farther information respecting one of the first of them, that at Spitalfields. Of this the committee gave the following account:—Four iron boilers have been erected on the premises, capable of making 2100 quarts of soup. It is made according to the annexed receipt, a copy of which is hung up in the boiling-house for reference: its average price, exclusive of rent, wages, boilers, and improvements on the premises, is rather more than 1½d. per quart. The following assistants have been found necessary: a woman as superintendant, who lives in the house, rent free; her office is to attend the cooking, to measure out the soup, and to see that cleanliness be observed. There are also three men, hired by the week, who, under the direction and inspection of sub-committees, prepare the meat and ingredients for making the soup, attend the process, and scour and keep clean the boilers, utensils, and premises, which is considered by the committee an object of great importance.

Three members of the committee are appointed in turn as daily visitors; at least two of them attend at 6 o'clock in the evening, to see the meat sent in during the day weighed, and afterwards apportioned, cut up, and put into the boilers, and the remainder hung up in the larder; the fires are then lighted, and the pease and other ingredients are weighed out, and afterwards locked up in the store-room; the key of which, together with that of the larder, are given to the superintendant. Before 11 o'clock on the following morning, the same three visitors attend, for the purpose of delivering the soup to the poor: one of them is employed in giving out numerical tickets to those who bring recommendations signed by subscribers. Another visitor is occupied in receiving the money, and reporting the number of each ticket, and the number of quarts, to the third visitor, who registers them in a numerical book, by which it is intended to prevent the application of the same persons more than once on the same day. Thus by the regularity and dispatch used in serving the soup, 2100 quarts of soup have frequently been delivered in less than two hours and a half.

The following is the receipt of the ingredients employed in making 100 gallons of this soup:

8 Stone of beef, or 64lb.	24 lbs. of onions.
16 Ditto shins.	8 lbs. of salt.
46 lbs. of pease.	10 oz. of black pepper.
36 lbs. of Scotch barley.	

The boiler in which the soup is to be made is nearly filled with water before the other ingredients are put in, and is filled up with boiling water in the morning, to make up for evaporation during the night; during the whole of which, the soup continues simmering: the fire being damped in the evening, and heaped up with a mixture of small coal, ashes, and water, which prevents its going out in the night.

The following observation will, we trust, have a good and a general effect:—If a desire should arise in the breast of any individual under whose

whose consideration this may fall, to assist the poor in his vicinity, by the benefits which such an institution holds forth, let not the apparent magnitude of the undertaking deter such an one; a little calm consideration and conference, assisted by an account of the mode in which such an institution is conducted, will suffice to prove that it will not be a difficult task; let him, therefore, call together a few well-disposed neighbours, whose ready disposition to serve the poor cannot be doubted, (and may not such be found in every town and village?) and consult with them upon the propriety of assisting the poor under their present pressure.

WHEATEN BREAD. The annual consumption of a person in health is averaged at one quartet of wheat (Winchester measure), which an ingenious and benevolent inhabitant of Liverpool divides as follows: 180lbs. of fine flour, 124 coarse ditto, and 68 of bran and loss, amounting in the entire to 372lbs; adding that Liverpool, calculating its population at 60,000 persons, would, at the present price of grain, save 26,000l. a-year by making household bread, in which the whole 404lbs. of flour should be used, and the bran alone omitted. The writer proceeds to state, that, by taking 47 instead of only 45lbs. from a bushel of wheat, an annual saving in the consumption of 60,000 persons would be effected of more than 2,588 quarters, which, allowing three quarters to be produced by one statute acre, would require 863 acres of land; and, on a supposition that it would yield wheat but once in four years, would require for the produce of such one year's difference 3,352 acres. Adapting this ingenious calculation to the capital, whose population is rated at 1,200,000 persons, the saving by the use of household bread would amount to 520,000l. a-year; whilst, by taking 47 instead of only 45lb. of flour from each bushel of 57lb. of wheat, 67,040 acres or 100 square miles, would be annually saved, and of course virtually added to the use of this country.

COALS. At no time within the memory of man was London ever so unprovided with coals as at this moment; and therefore, every means that can be employed to provide for our wants, or to economise the consumption, ought to be resorted to. On the continent there is a practice of mixing coal-dust with a mixture of earth and clay, which makes a very wonderful economy in the consumption; and nothing is more easy than the composition: one third of coal-dust, or of the cheapest and smallest coal, made up with double the quantity of clay into a round ball about the size of an eight-pound shot, and dried, will produce a heat fit for every purpose of a family, and which will endure five times as long as the unmixed coal. The mode of using this fire stone, as it is called, is, to place it in the grate, in making the morning fire; and, after being thoroughly heated, it will continue so for the whole day. Might not the subscription societies encourage the manufacture of these firestones, and sell them to poor families, as they do soup?

The high price which coals frequently bear in this city during the winter, is matter of serious concern. According to the present system, it seems as if the coals were supplied only in sufficient quantities to answer the immediate call for them; and, whenever an interruption happens to the navigation, a scarcity is immediately felt, and an advance in price takes place. In a plan presented some time ago to the public, it was proposed to guard against such a scarcity, by forming

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ing in the Isle of Dogs an artificial coal-mine; that is to say, by keeping constantly a large quantity of coals there to answer the demand that there might be at such times as the ships should be prevented from getting into the Pool. But we have near the city many real coal-mines, from whence we could be supplied, if they were allowed to be worked. We all know and admire the policy that says our coals shall come from Newcastle; nevertheless it appears, that, if there are veins of coal in any of the lands near the metropolis, they might be suffered to be worked at certain times, and under certain regulations. The old system has been productive of much benefit to our navy, thought it might be supposed our present wide-extended commerce rendered a strict adherence to it not so necessary at this time as heretofore; but the coal-mines near the metropolis might be allowed to be worked under such regulations as that the measure should not interfere with the present mode of supply—it might be regulated as the importation of corn is, i. e. that we might allow the coal-mines near the metropolis to be worked, and the city to be supplied from them, at any time when coals shall be at a certain price, which price might be fixed so high as not at all to check the present trade, by making it still as much as ever the interest of persons to keep their ships in that employ. All that can be necessary to secure a continuance of the present collier-trade is, to give it a monopoly at such price as shall pay the ship-owners very well; all beyond this appears to be but taxing the public unnecessarily. Thus, if something like what is here suggested could be put in practice, the price of coals could never exceed here a certain sum.

DEC. 28, 1799.

NUMBER OF INHABITANTS IN IRELAND.

SIR WILLIAM PETTY, who surveyed the whole kingdom of Ireland, states the population in 1672, at 1,100,000. In his second Drapier's Letter, published in 1724, Dean Swift observes, that the inhabitants then amounted to 1,500,000. In 1732, an enumeration of the inhabitants was made by order of government, and they were found to be under two millions. A calculation was made in 1791 from the hearth-money books and several other documents, and the population was, on the authority of those articles, stated at 4,200,000; and, it was thence decided, that the inhabitants had been nearly quadrupled in the course of 100 years.

Dr. Duigenan, however, differs from that calculation, and is of opinion, that all the inhabitants of Ireland do not amount to more than 3,000,000. The reasons he assigns for the opinion, are very strong. He observes, that England and Wales, with advantages superior to those enjoyed by Ireland, have not increased their population more than 1,500,000 since the revolution in 1688, while that of the latter is supposed to have been augmented to 3,000,000. It must also be remarked, that Ireland has, since the revolution, furnished the armies of foreign potentates, as well as those of Great Britain, with multitudes of soldiers, and many foreign nations, particularly America, with crowds of emigrants. He thinks, that the calculation of six persons to a house of one hearth is too great, as not more than four, if so many, should be allowed. The number of houses has also been erroneously stated. Dr. Duigenan, after ob-

erving that the superficial contents of England and Wales are, to those of Ireland, in the proportion of two to one, appeals to every intelligent man, who has travelled over the two nations, whether the local population of Ireland be not vastly inferior to that of England and Wales. If England and Wales have mountains and wastes, Ireland has her mountains, wastes, bogs, lakes, and morasses, of much greater extent, comparatively speaking; and, in the inhabited parts of the two nations, the populousness of England and Wales exceeds that of Ireland in a very great ratio. Either the calculation of the number of inhabitants in England and Wales falls vastly short of the real number, or the number of the inhabitants of Ireland is grossly exaggerated; and, it is probable, if Ireland contains four millions, that England and Wales contain, at least, twelve millions.

The doctor concludes his observations in the following manner:—"I am decidedly of opinion, that the number of the inhabitants of Ireland has been exaggerated; and particularly, because I have known it to be a custom in Ireland for gentlemen who have assumed the title of patriots, constantly to exaggerate the strength and importance of Ireland, with a view of bearding Great Britain. A sort of inferior member of this class of politicians, and an united Irishman, lately published a pamphlet, in Dublin, relating to the health of the citizens, in which he asserts that the inhabitants of Dublin amount to 400,000, though I never before heard them computed at a greater number than 150,000, and they are certainly under 200,000. I am myself of opinion, that the whole inhabitants of Ireland do not amount to more than 3,000,000, if so many."

GALLERIES OF NATURAL HISTORY AT PARIS.

IN the magnificent collection of birds, there are several new species which have not hitherto been described, nor published by any traveller or naturalist. Among these are the following, which C. Lacepede has classified according to his method, and to which he has annexed specific names.

Psittacus phygi, the parroquet. The feathers which cover the belly of this bird are of a very beautiful red. The inhabitants of the South-Sea Islands use them as ornaments for their heads, aigrettes, and aprons.

Psittacus cyanopterus, the blue-winged parroquet. This bird, of which the neck and a great part of the wings and tail are of a beautiful blue colour, came from the Philippine Isles,

Psittacus macrotarsus, a species of parroquet, remarkable for the length of its hind claw, and the little black and yellow specks which decorate its green plumage.

Paradisea rubra, the red bird of Paradise. What principally distinguishes it from the emerald-coloured species, which it in many respects resembles, is the red colour of the very long, slender, and delightful, plumage which covers both sides of the body above the wings.

Phasianus violaceus.—This large species of pheasant is distinguished by the most beautiful wavy colours, among which the violet predominates. It would be a very useful and a very easy task to breed it with the pheasants of Colchis, China, &c.

Phasianus Madagascariensis, the pheasant of Madagascar.—This is distinguished from the other species of pheasants by its fine red crest, and the smallness of its body.

Pomarinus fuscus, a water fowl of a kind not yet described. It considerably resembles the petrel, but differs from it in having a hind claw, and by the form of its nostrils, which are not, like those of the petrel, placed at the extremity of a sort of tube, but covered over with a very long, thin, and flat, membrane. Its beak is besides very much hooked at the extremity. It belongs, according to C. Lacepede's distribution, to the first order of water-fowls, or palmipedes.

THE P L A G U E.

HAVING read in the newspapers extracts of letters respecting the plague now raging in Barbary and other parts, I am induced to send you the following from a book on that most dreadful of all maladies, by the celebrated Dr. Mead, published in 1722, in hopes it may stimulate the legislature to take such steps as will prevent the evil gaining admittance into this country, for surely no commercial advantages can counter-balance so dreadful a scourge.

Dr. Mead says, I take the plague to be an African fever, bred in Ethiopia or Egypt, and the infection of it carried into other parts of the world by trade. Pliny observes, that it always travels from the southern to the western parts. The plague which broke out at Constantinople in the year 343 spread its infection over all the earth, and is said to have lasted fifty-two years. The last plague in London, says Dr. Hodges, was brought to us from Holland, but carried there by cotton imported from Turkey. In the year 1346, it raged in Egypt, Turkey, Greece, Syria, and the East Indies, in 1347, some ships from the Levant carried it to Sicily, Pisa, Genoa, &c. in 1348, it got into Savoy, Provence, Dauphiny, Catalonia, &c. in 1349, it seized England, Scotland, Ireland, and Flanders; and the next year, Germany, Hungary, and Denmark, making such dreadful destruction, that it is said to have dispeopled the earth of more than half its inhabitants. It is very remarkable, that the several countries of Europe have always suffered more or less in this way, according as they have had more or less commerce with Africa. Goods from infected places extend the infection more than by any other means. The seeds of the plague may lie dormant a whole winter, but break out again in the spring, and when the constitution of the air happens to favour infection, it rages with greater violence. Contagious matter lodges most in goods of a loose and soft texture, which being packed up and carried into other countries, let out, when opened, the empoisoned seeds of infection. In the plague at Florence, 1348, two hogs finding in the streets rags which had been thrown out from a poor man dead of the disease, after snuffing on them and tearing them with their teeth, fell into convulsions, and died in less than an hour. In the plague in Verona, no less than 25 persons were successively killed by the infection of one fur garment; and Forestus mentions an instance of seven children who died by playing on cloths brought to Alkmaar in North Holland, from an infected house in Zealand. Mr. Williams, chaplain to Sir Robert Sutton, formerly ambassador at Constantinople, relates that

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a bassa, who made an expedition to the frontiers of Poland, one of the janissaries under his command died of the plague; his jacket being a very rich one, another janissary bought it, and he died; and the like misfortune befel five more who had it; and then the bassa (spine of his tenets) ordered it to be burned. Dr. Mead writes, that the greatest danger is from such goods as are most apt to contain infection; such as cotton, hemp, flax, paper, books, silk, linen, wool, feathers, hair, and all kinds of skins; these, he says, ought to be unpacked and exposed in quarantine in the fresh air for forty days: too much caution in this point cannot be used. Again, he says, unless goods are opened when put into the lazarettos, it will avail nothing. The learned Dr. Halley relates, that a sack of cotton, put on-shore by stealth in the island of Bermuda, lay above a month without any prejudice to the people of the houses where it was hid; but, when it came to be distributed among the inhabitants, it carried such a contagion with it, that the living scarcely sufficed to bury the dead. Alex. Benedictus gives a very distinct relation of a feather-bed that was laid by for seven years on suspicion of its being infected, which produced mischievous effects at the end of that great length of time; and Sir Theodore Maxerne, in a paper of advice against the plague, laid before the king in council, in 1651, says, that some cloths fouled from plague sores, being lodged between matting and the walls of a house at Paris, gave the plague several years after to a workman who took them out, which presently spread through the city. Dr. Mead writes, if a ship comes from any place where the plague raged with more than usual violence at the time of its departure, it will be the securest method to burn all the goods, and even the ship. The plague will often stop at the approach of winter, but break out with redoubled force in the warmth of spring; as in the great plague at Genoa, in the first summer about 10,000 died, in the winter hardly any; but in the summer after no less than 60,000: and the same with the last plague in London, which appeared in the latter end of the year 1664, and was stopped by a hard frost of three months till the ensuing spring. Now, if goods brought from an infected place should contain any of the latent contagion, there will be danger of their producing the same mischief in the place to which they are brought, as they would have caused in the place from whence they came.—DEC. 10, 1799.

DIRECTIONS FOR PRESERVING MEAT AT SEA WITHOUT SALT.

SALTED meats form the general food of persons at sea, and, however carefully they may be prepared, the use of them is at all times pernicious. When vessels are a long time at sea without putting into any port, the scurvy is found to rage amongst the crews, and in a manner the more dangerous, as the means of cure are slow and uncertain. I had long reflected on the mode of preparing meat so as that it may be preserved a long time without the use of salt, and consequently without impairing its nutritive qualities. When I was in the Spanish part of the Island of St. Domingo, I had frequent occasion to make use of tassos, which are long slices of meat, deprived of its fat, and afterwards dried in smoke. This tasso preserves itself for a long time without any alteration, even in that hot climate,

climate, when it is well prepared. I considered of employing similar means, with some modifications, in order to secure the dried meats from the effects of humidity, and of preparing a large quantity in a manner least expensive. The following is the process which I have employed: it is the result of many experiments, with which I had every reason to be satisfied.

It will be necessary in the slaughter-house of the marine to select the most fleshy parts of the four quarters of the beeves which are killed for their daily consumption, which of course must then be doubled. The muscles being cleared of the surrounding fat, are to be cut into large slices perpendicularly, according to the direction of the fibres. These slices are to be exposed to the heat of the ovens in which the bread and biscuit is baked for the use of the navy, when they are at a heat of no more than fifty degrees by the thermometer of Reaumur, and to remain there until the ovens be cold: an opening should be left for the evaporation of the moisture. The same operation is to be repeated, taking care to turn the large slices, until they are entirely dried, and of an horny but friable consistence. On the other hand it will be necessary to melt the fat which has been taken away with the suet of the cattle, and to purify the whole by means of salt and boiling water; but in the fat thus purified care must be taken that no moisture shall remain, and it would also be of advantage if some aromatic herbs were employed in this part of the process. Every thing being thus prepared, a number of casks should be ready, those which have served for the conveyance of sweet oil are most suited for the purpose; the slices of dried meat are in these to be placed in layers, and the melted fat, not being too hot, is to be poured in upon them. The casks are then to be headed, taking care that no vacant space is left, and both ends are immediately to be caulked.

This process, very simple, and by no means expensive, being executed with precision, has the advantage of securing an agreeable food, of preserving the health of the sailors, and of containing a double quantity of provisions in the same space that would be occupied by meat salted in the ordinary manner. The provision being reduced into a small compass, a smaller quantity may of course be given. The fat of the beef, being purified with care, may serve to season the roots and greens, and to enrich the soup of the crews.

The process is to be exactly the same with respect to mutton; and, where this is not dearer than beef, such a quantity may be laid in as to preclude entirely the necessity of using salted provisions.

CARMEN SECULARE.

MR. PYE, in his preface to the Ode for the New Century, pays much respect to the opinion of those who differ from him on the subject of the commencement of the nineteenth century, but brings in aid of his own sufficient authority to justify him in publishing his *Carmen Seculare* in the year 1800. The extracts which follow are certainly the most satisfactory authorities that have yet appeared of the time, from the birth of Christ, being marked by the cardinal number of years. Mr. Pye thus expresses himself:—

“The controversy about the commencement of the nineteenth century, which has lately so much occupied the public mind, being
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of consequence to me, who am officially called on to give a public opinion on it, I very early turned my thoughts to the subject, and soon adopted the notion most generally received, that January 1, 1801, would be the first day of the nineteenth century.

"I found, however, all authority drawn from former precedents against me; I found that the Secular Masqué of Dryden was performed at Drury-lane theatre early in the year 1700; and that Prior's *Carmen Seculare* was written for the same year, and obviously for the 1st of January. These examples were sufficient authority for me, independently of their shewing the received opinion of that time. I found also in the schedule to the act of parliament for altering the style, and which is printed in all the Common Prayer Books, these words:—"For the next century, that is, from the year 1800 to the year 1899, inclusive."

"In the French *Encyclopedie*, Article *Lettre Dominicale*, we find, "Il changera en 1800, en 1900, en 2100, &c. en un mot, au commencement de chacun des siècles dont la première année n'est pas bissextile." And again, under *Cycle Solaire*, explaining the tables, it says, "La première de ces tables sera pour le siècle qui a commencé par l'année 1600; la seconde pour les siècles qui commencent par les années 1700, 2100, 2500, 2900, 3400, &c."

"There is yet a stronger authority, arising from the history of the institution of the Christian era, as it is usually called, though now known not to be reckoned from the real birth of our Saviour, but which makes no difference with respect to the present question.

"A native of Scythia, Dionysius Exiguus, so named from his stature, who exercised the function of abbot at Rome, in the sixth century, thinking it disgraceful that the Christians should reckon their years from the foundation of a city which was the seat of their persecutors, resolved to introduce a new era from the birth of Christ, which he fixed on the 25th of December, in the year of Rome, 1753; but to accommodate it to the Roman calendar, he reckoned from the 1st of January ensuing, in the manner that he exemplified by the following table of the first century, and on which the calculation of the beginning and close of the century just commenced in the table in our Common Prayer books is founded.

0	1	2	3	4	5	6	7	8	9	10, &c

ON THE VALUABLE PROPERTIES OF MILK.

ACCORDING to Dr. Cullen, milk is a connecting and intermediate substance between animals and vegetables. It seems immediately to be secreted from the chyle, both being a white liquor of the same consistence: it is most copiously secreted after meals, and of an acescent nature. In most animals who live on vegetables, the milk is acescent; and it is uncertain, though at the same time no observation proves the contrary, whether it is not so likewise in carnivorous animals. But, whatever be in this, it is certain, that the milk of all animals who live on vegetables is acescent. Milk being derived from the chyle, we thence conclude its vegetable nature; for in those who live on both promiscuously, more milk is got, and more quickly, from the vegetable than the animal food. Milk, however, is not purely vegetable; though we have a vegetable liquor

liquor that resembles its taste, consistence, colour, acescency, and the separability of the oily part, viz. an emulsion of the nukes oleosæ and farinaceous substances. But these want the coagulable part of milk, which seems to be of animal-nature, approaching to that of the coagulable lymph of the blood. Milk, then, seems to be of an intermediate nature, between chyle taken up from the intestines and the fully elaborated animal-fluid.

Its contents are of three kinds; first, an oily part, which, whatever may be said concerning the origin of other oils in the body, is certainly immediately derived from the oil of the vegetables taken in, as with these it agrees very exactly in its nature, and would entirely if we could separate it fully from the coagulable part. Another mark of their agreement is the separability, which proves that the mixture has been lately attempted, but not fully performed. 2dly, Besides this oily, there is a proper coagulable part. And, 3dly, Much water accompanies both, in which there is dissolved a saline saccharine substance. These three can be got separate in cheese, butter, and whey; but never perfectly so, a part of each being always blended with every other part.

Nothing is more common, from what has been said of its immediate nature, than to suppose that it requires no assimilation; and hence has been deduced the reason of its exhibition in the most weakly state of the human body. But, wherever we can examine milk, we always find that it coagulates, suffers a decomposition, and becomes acescent. Again, infants, who feed entirely on milk, are always troubled with eructations, which every body observes are not of the same quality with the food taken; and therefore it appears, that, like all other food, milk turns naturally acescent in the stomach, and only enters the chyle and blood in consequence of a new recombination. It approaches then to the nature of vegetable aliment, but is not capable of its noxious vinous fermentation, and therefore has an advantage over it; neither from this quality, like animal-food, is it heating in the stomach, and productive of fever; though at the same time, from its quantity of coagulable matter, it is more nourishing than vegetables.

Milk is the food most universally suited to all ages and states of the body; but it seems chiefly designed by nature as the food of infants. When animals are in the *fœtus*-state, their solids are a perfect jelly, incapable of an assimilatory power. In such state nature has perfectly assimilated food, as the albumen ovi in the oviparous, and in the viviparous animals certainly somewhat of the same kind, as it was necessary the vessels should be filled with such a fluid as would make way for an after-assimilation. When the infant has attained a considerable degree of firmness, as when it is separated from the mother, yet such a degree of weakness still remains as makes somewhat of the same indication necessary, it behoves the infant to have an alkalescent food ready prepared, and at the same time its noxious tendency to be avoided. Milk then is given, which is alkalescent, and, at the same time, has a sufficient quantity of acidity to correct that alkalescency. As the body advances in growth, and the alkalescent tendency is greater, the animal, to obviate that tendency, is led to take vegetable food, as more suited to its strength of assimilation.

Dr.

Dr. Cullen observes, that milk is almost suited to all temperaments; and it is even so to stomachs disposed to acescency, more than those substances which have undergone the vinous fermentation; nay, it even cures the heart-burn, checks vinous fermentation, and precipitates the lees, when, by renewal of fermentation, the wine happens to be fouled. It therefore very properly accompanies a great deal of vegetable aliment; although sometimes its acescency is troublesome, either from a large proportion taken in, or from the degree of it; for, according to certain unaccountable circumstances, different acids are formed in the stomach in different states of the body; in a healthy body, e. g. a mild one; in the hypochondriac disease, one sometimes as corrosive as the fossil acid. When the acidity of milk is carried to a great degree, it may prove remarkably refrigerent, and occasion cold crudities, and the recurrence of intermittent fevers. To take the common notion of its passing unchanged into the blood, it can suffer no solution. But, if we admits its coagulum in the stomach, then it may be reckoned among soluble or insoluble foods, according as that coagulum is more or less tenacious. Formerly rennet, which is employed to coagulate milk, was thought an acid; but, from late observations, it appears, that, if it be an acid, it is very different from other acids, and that its coagulum is stronger than that produced by acids. It has been imagined, that a rennet is to be found in the stomachs of all animals, which causes coagulation of milk; but to Dr. Cullen the coagulation of milk seems to be owing to a weak acid in the stomach, the relicts of our vegetable food, inducing, in healthy persons, a weak and soluble coagulum: but in different stomachs this may be very different, in these becoming heavy and less soluble food, and sometimes even evacuated in a coagulated undissolved state both by stomach and stool.

As milk is acescent, it may be rendered sometimes purgative by mixing with the bile; and some examples of this have been remarked. More commonly, however, it is reckoned among those foods which occasion costiveness.

Hoffman, in his experiments on milk, found that all kinds of it contained much water; and, when this was dissipated, found the residuum very different in their solubility. But we must not thence conclude, that the same insolubility takes place in the stomach; for extracts made from vegetables with water are often very insoluble substances, and hardly diffusible through water itself: therefore, in Hoffman's extracts, if we may so call them, of milk, somewhat of the same kind might have appeared; and these substances, which in their natural state were not so, might appear very insoluble. However, we may allow that milk is always somehow insoluble in the intestines, as it is of a drying nature, and as cheese, &c. is very costive. And this effect shews that milk is always coagulated in the stomach: for, if it remained fluid, no fæces would be produced, whereas sometimes very hard ones are observed. In the blood-vessels, from its animal-nature, it may be considered as nutritious; but when we consider its vegetable contents, and acescency in the primæ viæ, we find that, like animal-food, it does not excite that degree of fever in the time of digestion, and that from its acescency it will resist putrefaction. Hence its use in hectic fevers, which, whatever be their cause, appear only to be exacerbations of
natural

natural feverish paroxysms, which occur twice every day, commonly after meals, and at night. To obviate these, therefore, we give such an aliment as produces the least exacerbation of these fevers: and of this nature is milk, on account of its acefcent vegetable nature.

There appears also somewhat peculiar to milk, which requires only a small exertion of the animal-powers in order to its assimilation; and besides, in hectic complaints there is wanted an oily bland food, approaching to the animal-nature; so that on all these accounts milk is a diet peculiarly adapted to them, and, in general, to most convalescents, and to those of inflammatory temperaments. So far of milk in general. We shall now speak of the particular kinds which are in common use.

The milk of women, mares, and asses, agree very much in their qualities, being very dilute, having little solid contents, and, when evaporated to dryness, having these very soluble, containing much saccharine matter, of a very ready acefcenty, and, when coagulated, their coagulum being tender and easily broke down. From this view they have less oil, and seem to have less coagulable matter than the rest.

The milk of cows, sheep, and goats, agree in opposite qualities to the three just mentioned; but here there is somewhat more of gradation. Cows milk comes nearest to the former milk: goats milk is less fluid, less sweet, less flatulent, has the largest proportion of insoluble part after coagulation, and indeed the largest proportion of coagulable part; its oily and coagulable parts are not spontaneously separable, never throwing out a cream, or allowing butter to be readily extracted from it. Hence the virtues of these milks are obvious, being more nourishing, though at the same time less easily soluble in weak stomachs, than the three first, less acefcent than these, and so more rarely laxative, and peculiarly fitted for the diet of convalescents without fever. The three first again are less nourishing, more soluble, more laxative, as more acefcent, and adapted to the convalescents with fever.

These qualities, in particular milks, are considerably diversified by different circumstances. First, Different animals, living on the same diet, give a considerably different milk; for there seems to be something in the constitution, abstracting from the aliment, which constitutes a considerable diversity of milk, not only in the same species of animals, but also in the same animal, at different ages, and at different distances after delivery: this applies to the choice of nurses. Secondly, Milk follows the nature of the aliment more than any other juice in the human body, being more or less fluid and dilute, more or less solid and nourishing, in proportion as these qualities are more or less in the aliment. The nature of the aliment differs according to its time of growth, e. g. old grass being always found more nourishing than young. Aliment, too, is always varied according to the season, as that is warm or dry, moist or cloudy.

The milk of each particular kind of animal is fitter for particular purposes, when fed on proper food.—Thus the cow delights in the succulent herbage of the vale: if the sheep be fed there he certainly rots, but on the higher and more dry side of the mountain he feeds pleasantly and healthy; while the goat never stops near the bottom, but ascends to the craggy summit: and certainly the milks of these animals are always best on their proper soil, and that of goats is best

on a mountainous country. From a dissertation of Linnæus, we have many observations concerning the diversity of plants on which each animal chooses to feed. All the Swedish plants which could be collected together, were presented alternately to domestic animals, and then it appeared that the goat lived on the greatest variety, and even on many which were poisonous to the rest; that the cow chose the first succulent shoots of the plant, and neglected the fructification; which last was preferred by the goat. Hence may be deduced rules concerning the pasturage of different animals; e. g. Farmers find, that, in a pasture which was only fit to feed a certain number of sheep, an equal number of goats may be introduced, while the sheep are no less nourished than before.

It is not easy to assign the difference between milk fresh-drawn and that detained in the open air for some time: but, certainly there is some material one, otherwise nature universally would have directed infants to sucking; and indeed it seems, better than the other, fitted for digestion and nourishment. Physicians have supposed that this depended on the evaporation of some *spt. rectior*. but our author cannot conceive any such, except common water, here; and besides, these volatile parts can hardly be nutritious. A more plausible account seems deducible from mixture: milk new-drawn has been but lately mixed, and is exposed to spontaneous separation, a circumstance hurtful to digestion; none of the parts being, by themselves, so easily assimilated as when they are all taken together. Hence, then, milk new-drawn is more intimately blended, and therefore then is most proper to weakly persons and infants.

Another difference in the use of milk exposed for some time to the air, is taking it boiled or unboiled. Physicians have generally recommended the former; but the reason is not easily assigned. Perhaps it is this:—Milk kept for some time exposed to the air has gone so far to a spontaneous separation; whereas the heat thoroughly blends the whole, and hence its resolution is not so easy in the stomach; and thus boiled milk is more costly than raw, and gives more faeces. Again, when milk is boiled, a considerable quantity of air is detached, as appears from the froth on the surface; and air is the chief instrument of fermentation in bodies; so that after this process it is not liable to acescency: for these reasons it is proper for the robust and vigorous.

Another difference of milk is, according as it is fluid or coagulated. The coagulated is of two kinds, as induced by rennet, or the natural acescency of the milk. The former preparation makes the firmer and less easily soluble coagulum; though, when taken with the whey unseparated, it is less difficult of solution, though more so than any other coagulum in the same case. Many nations use the latter form, which is easier soluble, but very much acescent, and therefore, in point of solution, should be confined to the vigorous, in point of acescency, to those who live on alkalescent food; and in the last case, the Laplanders use it as their chief acescent condiment. From the same considerations it is more cooling, and in its other effects like all other acescent vegetables.

Milk by evaporation yields a sweet saline matter, of which Dr. Lewis gives the following proportions:

Twelve

Twelve ounces of	Left of dry matter	From which water ex- tracted a sweet saline sub- stance amounting to
Cows milk	13 drams.	1½ drachms.
Goats milk	12½	1½
Human milk	8	6
Asses milk	8	6

The saline substance extracted from asses milk was white, and sweet as sugar; those of the others brown or yellow, and considerably less sweet; that from cows milk had the least sweetness of any.

On distilling twelve quarts of milk *in balneo mariz*, at least nine quarts of pure phlegm were obtained: the liquor which afterwards arose was acidulous, and by degrees grew sensibly more and more acid as the distillation was continued. After this came over a little spirit, and at last an empyreumatic oil. The remaining solid matter adhered to the bottom of the retort, in the form of elegant shining black flowers, which being calcined and elixated yielded a portion of fixed alkaline salt.

Milk set in a warm place, throws up to the surface an unctuous cream, from which, by agitation, the butter is easily separated. The addition of alkaline salts prevents this separation, not (as some have supposed) by absorbing an acid from the milk, but by virtue of their property of intimately uniting oily bodies with watery liquors. Sugar, another grand intermedium betwixt oils and water, has this effect in a greater degree, though that concrete is by no means alkaline, or an absorbent of acids.

The sweet saccharine part of the milk remains dissolved in the whey after the separation of the curd or cheesy matter, and may be collected from it a white crystalline form, by boiling the whey till all remains of the curdled substance have fallen to the bottom; then filtering, evaporating it to a due consistence, setting it to shoot, and purifying the crystals by solution in water and a second crystallization. Much has been said of the medicinal virtues of this sugar of milk, but it does not seem to have any considerable ones: it is from cows milk that it has been generally prepared; and the crystals obtained from this kind of milk have but little sweetness.

When milk is suffered to coagulate spontaneously, the whey proves acid, and on standing grows more and more so till the putrefactive state commences. Sour whey is used as an acid, preferably to the directly vegetable or the mineral acids, in some of the chemical arts; as for dissolving iron in order to the straining of linen and leather. This acid was commonly made use of in the bleaching of linen, for dissolving and extracting the earthy particles left in the cloth by the alkaline salts and lime employed for cleansing and whitening it. Butter-milk is preferred to plain sour-milk or sour-whey: this last is supposed to give the cloth a yellow colour. Dr. Home, in his ingenious treatise on this subject, recommends water acidulated with spirit of vitriol (in the proportion of about half an ounce, or at most three quarters of an ounce, to a gallon), as preferable in many respects to the acid of milk, or of the more directly vegetable substances. He observes, that the latter are often difficultly procurable, abound with oleaginous particles, and hasten to corruption; whilst the vitriolic acid is cheap, and pure, and indis-

posed to putrefy : that milk takes five days to perform its office, whilst the vitriolic acid does it in as many hours, perhaps in as many minutes : that this acid contributes also to whiten the cloth, and does not make it weaker though the cloth be kept in it for months. He finds, that acids as well as alkalies, extract an oily matter from the cloth, and lose their acidity and alkalicity. Since this treatise appeared, the use of four-milk is very generally superseded by oil of vitriol.

It is observable, that asses milk is greatly disposed, on standing for a little time, to become thick and ropy. In the Breslau collection for the year 1720, there is a remarkable account of milk (which probably was that of the ass) grown so thick and tenacious as to be drawn out into long strings, which, when dried, were quite brittle.

New cows milk, suffered to stand for some days on the leaves of butterwort or sun-dew, becomes uniformly thick, slippery, and coherent, and of an agreeable sweet taste, without any separation of its parts. Fresh milk, added to this, is thickened in the same manner, and this successively. In some parts of Sweden, as we are informed in the Swedish Memoirs, milk is thus prepared for food.

New milk has a degree of glutinous quality, so as to be used for joining broken stone-ware. There is a far greater tenacity in cheese properly prepared.

Milk, when examined by a microscope, appears composed of numerous globules swimming in a transparent fluid. It boils in nearly the same degree of heat with common water ; some sorts rather sooner, and some a little later : after boiling, it is less disposed to grow sour than in its natural state. It is coagulated by acids both mineral and vegetable, and by alkalies both fixed and volatile. The coagulum made by acids falls to the bottom of the serum ; that made by alkalies swims on the surface, commonly forming (especially with volatile alkalies) a thick coriaceous skin. The serum, with alkalies, proves green or sanious ; with acids, it differs little in appearance from the whey that separates spontaneously. The coagulum formed by acids is dissolved by alkalies, and that formed by alkalies is redissolved by acids ; but the milk does not in either case resume its original properties. It is coagulated by most of the middle salts, whose basis is an earth or a metallic body ; as solution of alum, fixed sal ammoniac, sugar of lead, green and blue vitriol ; but not by the chalybeate or purging mineral waters, nor by the bitter salt extracted from the purging waters. Among the neutral salts that have been tried, there is not one that produces any coagulation. They all dilute the milk, and make it less disposed to coagulate with acids or alkalies.—Nitre seems to have this effect in a greater degree than the other neutral salts. It is instantly coagulated by highly-rectified spirit of wine, but scarcely by a phlegmatic spirit. It does not mingle with expressed oils. All the coagula are dissolved by gall.

It has generally been supposed by medical authors, that the milk of animals is of the same nature with chyle, and that the human milk always coagulates on the stomach of infants ; but in a late dissertation upon the subject by Mr. Clarke, member of the royal Irish academy, we find both these positions controverted. According to him, woman's milk, in an healthy state, contains no coagulable, mucilaginous, or cheesy, principle, in its composition ; or it contains so little, that it cannot admit of any sensible proof. Dr. Rutty
states,

states, that it does not afford even a sixth part of the curd which is yielded by cows milk; and Dr. Young denies that it is at all coagulable either by rennets or acids. This is confirmed by Dr. Ferris, who in 1782 gained the Harveian prize-medal at Edinburgh by a dissertation upon milk. Mr. Clarke informs us, that he has made a vast number of experiments upon woman's milk with a view to determine this point. He made use of ardent spirits, all the different acids, infusions of infants stomachs, and procured the milk of a great many different women; but in no instance, excepting one or two, did he perceive any thing like curd. This took place in consequence of a spontaneous acescency; and only a small quantity of soft flaky matter was formed, which floated in the serum. This he looked upon to be a morbid appearance.

The general opinion that woman's milk is coagulable, has arisen from a single circumstance, viz. that infants frequently vomit the milk they suck in a state of apparent coagulation. This greatly perplexed Dr. Young; who, after having tried in vain to coagulate human milk artificially, concluded, that the process took place spontaneously in the stomach; and that it would always do so if the milk were allowed to remain in a degree of heat equal to about ninety-six degrees of Fahrenheit. Mr. Clarke took equal quantities of three different kinds of milk, and put them into bottles slightly corked, and these bottles into water, the temperature of which was kept up by a spirit-of-wine lamp as near as possible to ninety-six degrees of Fahrenheit: but, after frequently examining each bottle during the experiment, at the expiration of several hours there was not the smallest tendency towards coagulation to be perceived in any of them; the cream was only thrown to the surface in a thick and adhesive form, and entirely separated from the fluid below, which had something of a grey and wheyish appearance. As the matter vomited by infants is sometimes more adhesive than we can suppose cream to be, Mr. Clarke supposed that the curd might be so entangled with the cream, as to be with difficulty separated from it; but, having collected a quantity of rich cream from the milk of different women, he repeated the experiment with precisely the same event, not being able in any one instance to produce the smallest quantity of curd. To determine, however, what effects might be produced upon milk by the stomach of an infant, Mr. Clarke made the following experiment: having taken out the stomach of a fœtus which had been deprived of life by the use of instruments, he infused it in a small quantity of hot water, so as to make a strong infusion. He added a tea-spoonful of this infusion to equal quantities of cows and human milk; the consequence of which was, that the cow's milk was firmly coagulated in a short-time, but the human milk was not altered in the least; neither was the least coagulation produced by adding a second and third spoonful to the human milk. "Upon the whole, then, (says Mr. Clarke,) I am persuaded it will be found, that human milk, in an healthy state, contains little or no curd, and that the general opinion of its nature and properties is founded upon fallacious analogy and superficial observations made on the matter vomited by infants. We may presume, that the cream of woman's milk, by its inferior specific gravity, will swim on the surface of the contents of the stomach; and, being of an oily nature, that it will be of more difficult digestion than

than any other constituent part of milk. When an infant then sucks very plentifully, so as to over-distend the stomach, or labours under any weakness in the powers of digestion, it cannot appear unreasonable to suppose, that the cream shall be first rejected by vomiting. Analogous to this, we know that adults affected with dyspepsia often bring up greasy fluids from the stomach by eructation, and this especially after eating fat meat. We have, in some instances, known this to blaze when thrown into the fire like spirit of wine or oil." Our author derives a confirmation of his opinion from the following observation, viz. that curds vomited by infants of a few days old are yellow, while they become white in a fortnight or three weeks. This he accounts for from the yellow colour of the cream thrown up by the milk of women during the first four or five days after delivery.

Mr. Clarke likewise controverts that common opinion of the human milk being so prone to acidity, that a great number of the diseases of children are to be accounted for from that principle. "Whoever (says he) takes the trouble of attentively comparing human milk with that of ruminant animals, will soon find it to be much less prone to run into the acedent or acid process. I have very often exposed equal quantities of human and cows milk in degrees of temperature, varying from the common summer heat, or 65° , to 100° ; and I have constantly found that cows milk acquires a greater degree of acidity in thirty-six hours than the human did in many days; cows milk becomes offensively putrid in four or five days; a change which healthy human milk, exposed in the same manner, will not undergo in many weeks, nay sometimes in many months. I once kept a few ounces of a nurse's milk, delivered about six or seven days, for more than two years in a bottle moderately corked. It stood on the chimney-piece, and was frequently opened to be examined. At the end of this period it shewed evident marks of moderate acidity, whether examined by the taste, smell, or paper stained by vegetable blues or purples; the latter is changed to a florid red colour, whereas cows milk kept a few days changed the colour of the same paper to a green, thereby clearly shewing its putrescent tendency."

Our author next goes on to consider of the probability there is of milk becoming so frequently and strongly acid as to occasion most of the diseases of infants. He begins with an attempt to shew, that the phenomena commonly looked upon to be indications of acrimony are by no means certain. Curdled milk has already been shewn to be no sign of acidity; and the other appearance, which has commonly been thought to be so certain, viz. green fæces, is, in the opinion of Mr. Clarke, equally fallacious. In support of this he quotes a letter from Dr. Sydenham to Dr. Cole; in which he says that the green matter vomited by hysterical women is not any proof of acrid humours being the cause of that disease, for sea-sick people do the same. The opinion of green fæces being an effect of acidity, proceeds on the supposition that a mixture of bile with an acid produces a green colour; but it is found, that the vegetable acid, which only can exist in the human body, is unable to produce this change of colour, though it can be effected by the strong mineral acids. As nothing equivalent to any of these acids can be supposed to exist in the bowels of infants, we must therefore take some other method of accounting for the green fæces frequently evacuated by them.

"Why

"Why should sour milk, granting its existence, give rise to them in infants, and not in adults? Have butter-milk, summer-fruits of the most acescent kind, lemon or orange-juice, always this effect in adults by their admixture with bile? This is a question which, I believe, cannot be answered in the affirmative."

On the whole, Dr. Clarke considers the disease of acidity in the bowels, though so frequently mentioned, to be by no means common. He owns, indeed, that it may sometimes occur in infancy as well as in adults, from weakness of the stomach, costiveness, or improper food; and an indubitable evidence is afforded by *scæces* which stain the blue or purple colour of vegetables to a red, though nothing can be inferred with certainty from the colour or smell.

The doctor next proceeds to state several reasons for his opinion, that the greater number of infantile diseases are not owing to acidity: 1. Woman's milk in an healthy state contains little or no coagulable matter or curd. 2. It shews less tendency out of the body to become acescent than many other kinds of milk. 3. The appearances which have been generally supposed to characterise its acidity do not afford satisfactory evidence of such a morbid cause. 4. Granting this to be the case, we have plenty of mild absorbents, capable of destroying all the acid which can be supposed to be generated in the bowels of an infant; yet many children are observed to die in consequence of these diseases supposed to arise from acidity. 5. Though the milk of all ruminant animals is of a much more acescent nature than that of the human species, yet the young of these animals never suffer any thing like the diseases attributed to acidity in infants. 7. History informs us, that whole nations use sour curdled milk as a considerable part of their food without feeling any inconvenience; which, however, must have been the case, if acidity in the stomach were productive of such deleterious effects as has been supposed.

The reasoning of Dr. Clarke seems here to be very plausible, and nothing has as yet been offered to contradict it. The Reviewers in taking notice of the treatise only observe, that the doctor's positions are supported by great probability; yet "they have seen them, or think they have seen them, contradicted by the appearance of diseases and the effects of medicines;" so that they must leave the subject to farther examination.

In a memoir by Messrs. Parmentier and Deyeux, members of the royal college of pharmacy, &c. in Paris, we have a great number of experiments on the milk of asses, cows, goats, sheep, and mares, as well as of women. The experiments on cows milk were made with a view to determine whether any change was made in the milk by the different kinds of food eaten by the animal. For this purpose some were fed with the leaves of maize or Turkey wheat; some with cabbage; others with small potatoes; and others with common grass. The milk of those fed with the Turkey wheat was extremely sweet; that from the potatoes and common grass much more serous and insipid; and that from the cabbages the most disagreeable of all. By distillation only eight ounces of a colourless fluid were obtained from as many pounds of each of these milks; which from those who fed upon grass had an aromatic flavour; a disagreeable one from cabbage; and none at all from the potatoes and Turkey wheat. This liquid became fetid in the space of a month,

month, whatever substance the animal had been fed with, acquiring at the same time a viscidty and becoming turbid; that from cabbage generally, but not always, becoming first putrid. All of them separated a filamentous matter, and became clear on being exposed to the heat of twenty-five degrees of Reaumur's thermometer. In the residuums of the distillations no difference whatever could be perceived. As the only difference therefore existing in cow's milk lies in the volatile part, our authors conclude, that it is improper to boil milk either for common or medicinal purposes. They observed also, that any sudden change of food, even from a worse to a better kind, was attended by a very remarkable diminution in the quantity of milk. All the residuums of the distillations yielded, in a strong fire, a yellow oil, an acid, a thick and black empyreumatic oil, a volatile alkali, and towards the end a quantity of inflammable air, and at least a coal remained containing some fixed alkali with muriatic acid.

On agitating, in long bottles, the creams from the milk of cows fed with different substances, all of them were formed into a kind of half-made butter; of which that formed from the milk from maize was white, firm, and inspid; that from potatoes was softer and more pinguedinous; but that from common grass was the best of all. Cabbage, as in other cases, gave a strong taste.

In the course of their experiments, it was endeavoured to determine whether butter is actually contained in the cream, or whether it be a chemical production of the operation of churning. They could not find any reason absolutely satisfactory on either side, but incline to the latter opinion; because when cream is allowed to remain among the milk, and the whole curdled promiscuously, only fat cheese, without any butter, is produced. The oily parts cannot be separated into butter either by acids or any other means than churning: even the artificial mixture of oil with the cream is insufficient for the purpose.

The serum of milk was reduced by filtration to a clear and pellucid liquor; and, by mixture with fixed alkali, deposited a portion of cheesy matter which had been dissolved in the whey. The sugar of milk was also found in this liquor.

In their experiments upon the milk of various animals, it was found, that the milk of asses yielded by distillation an inspid liquor, and deposited a liquor similar to the lymph of cows milk. It is coagulated by all the acids, but not into a uniform mass, exhibiting only the appearance of distinct flocculi. It affords but little cream, which is converted with difficulty into a soft butter that soon becomes rancid. It has but a small quantity of saccharine particles, and these are often mixed with muriatic selenite and common salt. Goats milk has a thick cream, and agreeable to the taste; and the milk itself may be preserved longer in a sound state than any other species, the scum on its surface being naturally convertible into palatable cheese. It is easily made into firm butter, which does not soon become rancid, and has a good flavour. The butter-milk contains a large quantity of cheesy matter, which readily coagulates; but has still less saccharine matter than that of asses. Sheep's milk can scarcely be distinguished from that of a cow, and easily parts with its cream by standing. It is of a yellow colour, an agreeable flavour, and yields a great proportion of butter; but this is not solid, and soon

soon becomes rancid. Mare's milk is the most insipid and least nutritious of any; notwithstanding which it has been much recommended for weak and consumptive patients: in which cases it is probable that it proves efficacious by being more consonant than any other to the debilitated powers of digestion. It boils with a smaller fire than any other kind of milk, is easily coagulated, and the distilled water does not soon change its nature. It has but a small quantity of cheesy matter, and very few oily particles: the cream cannot be made into butter; and the whey contains about as much sugar as cows or goats milk.

In this memoir our authors remark, that in order to augment the quantity, as well as to improve the quality, of the milk of animals, they should be well fed, their stalls kept clean, and their litter frequently renewed: they should be milked at stated hours, but not drained: great attention should also be paid to the breed; because inferior cattle are maintained at as great expence as the most valuable kinds. No change ought to be made in the food; though, if the milk be employed for medicinal purposes, it may be improved by a proper mixture of herbs, &c.

In their experiments on woman's milk, Messrs. Parmentier and Deyeux differ somewhat from Dr. Clarke. They first tried the milk of a woman who had been delivered four months; and observed, that after the cream had been separated the other part appeared of a more perfect white, and that it could not be coagulated either by vinegar or mineral acids; which they attributed to a superabundance of serum. But they found that in proportion to the age of the milk it was found to be more easily coagulable; and this was confirmed by experiments made upon the milk of twenty nurses. Its coagulability was not increased by heat. The cream, by agitation, formed a viscid unctuous matter, but could not be changed into perfect butter: but they found that it was extremely difficult to determine the proportions of the various component parts in human milk, as it differs remarkably, not only in different subjects, but in the same subject at different times. In a nurse aged about thirty-two years, who was extremely subject to nervous affections, the milk was one day found almost quite colourless and transparent. In two hours after, a second quantity drawn from the breast was viscid like the white of an egg. It became whiter in a short time, but did not recover its natural colour before the evening. It was afterwards found that these changes were occasioned by her having some violent hysteric fits in the mean time.

An account has been lately published of a method used by some of the Tartar nations, of preserving their milk by means of frost; in which operation great quantities of the sugar of milk are formed. The account was given by Mr. Fahrig of Petersburg, who undertook a journey, by order of the academy of Petersburg, among the Mogul tribes who inhabit the country beyond the lake Baikal, on the banks of the river Salenga. These people allow their milk to freeze in large quantity in iron kettles; and, when it is perfectly congealed, they place them over a gentle fire to soften the edges of the cake, after which it may be taken out with a wooden spatula. They commence these operations at the beginning of the cold, when they have milk in the greatest abundance; after which it may be preserved with great ease throughout the whole winter. Mr. Fahrig

having frequent opportunities of seeing these cakes, soon observed, that the surface of them was covered to a considerable depth with a farinaceous powder; and, having established a dairy upon the same plan with those of the Moguls, he found the same thing take place with himself. This powder was extremely sweet, and he received platefuls of it from the natives, who used it in their food, and sweetened their other victuals with it. Having caused a number of cakes of frozen milk to be conveyed to the top of his house where they were directly exposed to the violent cold, he found that the separation of the saccharine powder was greatly promoted by this means. He scraped the cakes every week to the depth of two inches, and afterwards spread out the powder upon an earthen plate in order to destroy the remains of moisture which might have prevented it from keeping for any length of time. When exposed in this manner it had a very agreeable and strong saccharine taste; dissolved in warm water; and when strongly stirred by means of a chocolate-slick, would at all times produce an excellent and well-tasted milk. Raw milk affords a much larger quantity of this saccharine matter than such as has been boiled, or which has had the cream taken off it. Neither must the milk be suddenly exposed to the cold before it has lost its natural heat; for the sudden contact of the cold drives all the cheesy and fat part towards the middle, while the external parts consist of little else than water. In order to allow the parts of the milk to be all properly mixed together, Mr. Fahrig allowed the milk when newly taken from the cows to cool, and then poured it out into shallow kettles.

Our author is of opinion that this method of making milk would be of great service to navigators to supply themselves with milk during long sea-voyages: and he assures us, from his own experience, that it will always succeed, if proper attention be paid to it. He is of opinion, however, that all countries are not equally proper for the preparation of this saccharine matter: and indeed this seems very evidently to be the case, as the process appears to be a crystallization of the saccharine parts of the milk, and a separation of them from the aqueous ones by means of extreme cold. The country in which he made the experiments is one of the most elevated in all Asia; and so cold, that, though it lies only in the 50th degree of north latitude, its rivers are frozen up for six months of the year. A very dry cold wind also prevails throughout almost the whole year; and the dry winds generally come from the north, being almost always preceded by a warm wind from the south, which blows for some time. The dry rarefied air increases the evaporation from the ice-cakes, and leaves nothing but the saccharine or pure constituent parts of the milk, which with the addition of water can always recompose the fluid.

Milk makes an innocent and efficacious forcing for the fining down of all white wines, arracks, and small spirits; but is by no means to be used for red wines, because it discharges their colour. Thus, if a few quarts of well-skimmed milk be put to a hoghead of red-wine, it will soon precipitate the greater part of the colour, and leave the whole nearly white; and this is of known use in the turning red wines, when pricked, into white; in which a small degree of acidity is not so much perceived.

Milk

Milk is, from this quality of discharging colour from wines, of use also for the whitening of wines that have acquired a brown colour from the cask, or from having been hastily boiled before fermenting; for the addition of a little skimmed milk, in these cases, precipitates the brown colour, and leaves the wines almost limpid, or of what they call a *water-whiteness*, which is much coveted abroad in wines as well as in brandies.

HOOLE'S TRANSLATION OF LEEUENHOEK, No. II.

OF THE MAGGOT OR CATERPILLER CALLED THE WOLF.

HAVING, as I hope, by my observations on the weevil, (see p. 173,) convinced mankind, that it is propagated in the ordinary way of generation, I have since employed myself in the examination of that insect or maggot which our bakers and corn-dealers name *de Wolf*, i. e. "the wolf."

This insect is not much known in England among the country people, for, the translator having procured from an importer of corn a sample of Prussian wheat infected with it, and shewn it to several farmers, the appearance seemed new to them, nor could they assign to the animal any name in English. But to the Dutch, who have always been great importers and exporters of corn, it seems to have been familiar, and the author's remarks on this subject may be well worthy the attention of our English merchants.

This creature is a very small white maggot, provided with two red pincers, or organs like teeth, placed in the fore part of its head, by which it not only feeds on and consumes wheat and other grain, but also can perforate or gnaw holes in wood. The common opinion is, that it is produced from corruption, or else from what some call a blight. But, in order to refute this vulgar error, I procured a box of wheat, in which this insect abounded, that I might discover the real manner of its propagation.

Upon inspecting this wheat, I found, that one single maggot had stuck or fastened together from five, to six, seven, or even eight, grains of wheat, in one of which itself was concealed, and that most of the other grains were hollowed or scooped out in the middle; and it seems to me that this maggot is much more pernicious than the weevil, because it scatters a great quantity of its excrements in the shape of white round balls, which are very large in proportion to the size of its body.

Moreover, this maggot has in the anterior or fore part of its head an organ, or instrument, through which it continually spins an exceeding fine thread, which thread it fixes to every substance it approaches. By this means its body is always supported so that it cannot fall, and in a clean glass it can move from place to place, being suspended by this thread, and by this thread also it connects or binds the grains of wheat together.

Some of this wheat I put into a glass tube, about the size of a finger, and a foot in length, closing each end with a good stopper, and the rest of the wheat I kept in a wooden box. Towards the end of the summer, I observed several of the maggots forsaking the wheat, and fastening themselves to the glass, and others of them I saw creeping about among my papers, and I found the box, in which

I had put them, perforated in two places, through which many of them had escaped. I also saw the stopper to the glass tube gnawed into, as deep as the thickness of a finger, and upon taking it out, I found that eight or ten of the maggots had crept into it; upon which I placed them again in the glass tube, with the grains of wheat, and, stopping the orifices with a cork, I covered the cork on the outside with sealing-wax, to prevent the maggots again escaping, but at the same time I contrived apertures, that they might not be deprived of air, but so small as not to permit their escape.

About the same time that I was employed in these observations, I visited a granary infested with this insect, and saw the maggots, in great numbers, creeping up the walls; whence I concluded, that in like manner as the maggots in the glass tube quitted the wheat, and lodged themselves in the stoppers, so in the granary they concealed themselves in the linings and beams, until their transformation into flying insects should be completed. And I was confirmed in this opinion by observing the granary to have been so perforated, or eaten into, by these maggots, that not a finger's breadth was left untouched by them.

I also observed that great part of the stopper which was within the glass tube, was gnawed or reduced to powder, and many chinks or crannies formed in it; and, though the maggots endeavoured to conceal themselves within the stopper, yet three of them remained in the glass, in which they lay quiet the whole winter, and they were so little covered with their web or thread, that, with the microscope, I could discover them move their heads. On the 29th of the April following, I saw them begin to assume a reddish colour, and to be somewhat contracted in length; the next day the redness increased, and they seemed to me to be turned into aurelias. At the same time, upon examining the wheat, which was kept in the box, and had been full of the maggots, I found that they had all escaped through the holes perforated by them in the box.

On the 23d of May, the aurelias before-mentioned, had become of a red colour, and the next day I saw a flying insect, called a moth, fluttering about the glass tube. This had proceeded from one of the aurelias, which had been the chief subject of my observations; and I saw lying near it, a pellicle, or little skin, which had been the case or sheath in its aurelia state. Two days before I discovered this moth, I had observed several of the same winged insects flying about my study, two of which I killed, and upon examining them by the microscope, I found them to be formed in the same manner with this in the glass, so that I was convinced they had proceeded from some of the maggots which had escaped out of the box. And on the 25th of May I saw two more moths come out of the stopper to the tube, leaving their shells or cases hanging to it.

On the same 25th of May, I went to the granary, where, the preceding autumn, I had seen the maggots before-mentioned creeping up the walls, and there I saw a number of moths, some clinging to the wall, and others flying about. I had brought with me six glass tubes; and, as it was easy to distinguish the males from the females, the former being smaller than the latter, I put in each of these glasses some of both sexes. At my return home, I dissected three of these females, and, by the most accurate reckoning I could make, I found in each of their bodies upwards of fifty eggs. At another
time,

time, I judged that I took out of another female moth, above seventy eggs. These eggs were exactly the shape of hens eggs, but no larger than small grains of sand. The rest of the moths which I had brought from this granary, and kept alive, laid many eggs, and one of them produced to the number of seventy.

I next considered, whether the moths, which thus propagate the pernicious insect I am treating of, might not by some means be destroyed in the granaries, so as to prevent their propagation. For this purpose I took a round glass vessel, large enough, as I supposed, to hold six pints of water, and in it I put eight living moths newly taken. In the orifice of this vessel I set fire to the fourth part of a grain of sulphur; and, as soon as the moths began to feel the vapour or smoke of the sulphur, they fluttered about the glass with great violence, though but for a short time, for they all fell to the bottom, and, after a little motion in their feet, they died. Four hours afterwards, I took them out of the glass, and put into it some fresh ones alive, in order to repeat the experiment; but, while I was preparing to burn the sulphur, I saw them all lie dead, they having been killed with the bare odour of the sulphur which had been left in the glass. From the size of this glass, I computed what quantity of sulphur would be requisite to fumigate a granary twenty-four feet long, sixteen broad, and eight feet high; and I reckoned that half a pound would be sufficient for the purpose.

After this I fumigated a granary, in which were eight loads of wheat, and a great number of moths flying about. For this purpose I took two pieces of sulphur, containing about a quarter of a pound, prepared in the same manner as is done by wine-merchants or coopers; to fumigate their wine casks. These pieces of sulphur I suspended by a brass wire, in a tall earthen vessel, with a narrow top, and placed the vessel in an earthen dish, to prevent any danger of fire. This apparatus I set in the middle of the wheat, and, as soon as the sulphur began to burn, I retired out of the granary and shut the door. In a large granary two or three of these vessels might be used. Two days afterwards, I visited the granary, and then I saw several moths still clinging to the wall and beams, but before the fumigation I believe there were ten times as many; and I accounted for these moths being found alive, by reason that many of the panes of glass in the windows were broken, through which much of the smoke of the sulphur had escaped; or else that the moths which I now saw had come out of their aurelia state after the fumigation was over; for I am well assured, that so long as the moths are inclosed in their aurelia case, or covering, the smoke of sulphur cannot do them any injury. Therefore it will be necessary for those who may chuse to fumigate their granaries in the manner I have recommended, to begin the operation as soon as ever the moths appear, that they may be prevented laying their eggs, and also to continue the use of it some days, indeed as long as any moths are to be seen, because these creatures do not all come out of their aurelia state at the same time. The expence of fumigating is no object, for a pound of sulphur may be bought for a trifle, and it is in no sort injurious to the wheat, nor is it prejudicial to the health of any person, but rather salubrious. Towards the end of summer, when the maggots quit the wheat, and creep up the walls, they may easily be swept down and destroyed; for this insect is a very tender animal, and soon killed.

And,

And, these precautions being observed, very few moths will be seen the following year.

Some of the eggs laid by these moths I put in glasses by themselves, which I carried about in my pocket; others of them I placed in my study; and I observed that those which I carried about me were, by the heat of my body, much sooner hatched than those which were in my study, for these latter were sixteen days before the maggots crept out of them; but at seven days end those in the former made their appearance. The fore part of this maggot is provided with six feet, which sometimes can be discerned when the animal lies flat on its belly; in the hind part are various organs assisting in its motion. As I observed some of these young maggots to be dying, I put some grains of wheat into the glass, and soon afterwards the living ones disappeared, whence I concluded that they had found their way into the wheat, and in three or four days time I saw their excrements scattered about the glass.

The moths I have been describing are very pretty objects to behold, the wings, which are four in number, being white, sprinkled all over with black spots; and on examining them by the microscope I found that this whiteness proceeded from the white feathers on the wings, and that the black spots were caused by other feathers which were black at the edges. Some thousands of these feathers I saw sticking to the glasses in which I kept the moths, which, in their fluttering against the glass or one another, had been rubbed off their wings and other parts of their bodies; and to the naked eye, exhibited the appearance of a vapour or smoke on the glass. Though I examined some thousands of these feathers, they were all so differently formed, that I cannot say I saw two exactly alike. At their broad ends, they are tinged with black, and, when several of them lie close together, they exhibit a black spot; others are transparent, but when lying one on another they produce the whiteness I have mentioned. All of them, although so very minute, have quills like the feathers of birds, by which they are fixed or rooted in the membrane that forms the wing, and so completely cover it that it cannot be seen. The feathers which cover the edges of the wings are much longer than the others, and of different shapes.

This maggot, which in Holland is called the wolf, is not only mischievous by devouring corn, but it is of that species which is found in houses, and gnaws holes in wood, also in boxes and books, and likewise hides itself in woollen garments, eating holes in them, and at length becomes a flying insect, or a moth. This moth, of itself, is very innocent; for, while in that state, it does not, as I could discover, take any food, but, if not destroyed in time, one female may produce seventy maggots, for out of upwards of seventy eggs, laid by one moth, I only saw one barren; and in three others of the eggs, I could discern the maggots lying dead, by reason, as I suppose, that they could not break the shells.

I heard it affirmed, by a corn-dealer, in support of his opinion that these maggots are produced in wheat spontaneously, that they are more rarely found in old wheat than in new; to which I gave for answer, that, when first hatched, they are very small and tender, so that it is difficult for them to pierce the husk of old wheat, the same being very dry and hard, and consequently many of them die for want of nourishment. This I fully proved by experiment; for
I had

I had three glasses standing in my study, in one of which there were more than sixty maggots newly hatched: in this glass I put some grains of wheat, one of which was broken, or split down the middle, and this alone was eaten into, the others remaining uninjured, and all the maggots, except one or two, died; all which, I had no doubt, proceeded from this, that these grains of wheat were remarkably dry and hard, having been kept for two or three years in a box in my study: and in another of the glasses, wherein I observed the maggots creeping about on the surface of the wheat, without being able to penetrate it, I cut several of the grains in pieces, and by this means many of the maggots were kept alive.

While I was examining the granary before-mentioned, I saw many very minute animalcules, no bigger than grains of sand, creeping up the walls. Some of these I brought home with me in glasses, and I observed them to couple together, and to lay excessively minute eggs, which eggs, after some time, produced animalcules formed like the parents. So that it appears these little creatures propagate their like without undergoing any such change as is observed in fleas, moths, flies, and many other insects.—I think, however, it is fully proved, that no living creature is produced from corruption or putrefaction. Indeed, can any man in his sober senses imagine, that the moth, of which I have given the description, which is fitly provided by nature with the means to propagate its species, furnished with eyes exquisitely formed, with horns, with tufts of feathers on its head, with wings covered with such multitudes of feathers, all of different shapes, and these exactly covering the wings in every part; can this moth, I say, adorned with so many beauties, be produced from corruption? For, in a word, in this little creature, contemptible as it seems to us, there shines forth so much perfection and skill in the formation, as to exceed what we observe in larger animals.

[This work is embellished with Engravings from the original Plates, and others added by the Translator.]

ACCOUNT OF THE ISLAND OF ST. BARTHOLOMEW.

ST. BARTHOLOMEW is a small island belonging to Sweden, in the West Indies, lying at a little distance from St. Eustatia and St. Christopher. A Swedish writer gives the following account of it in a publication entitled, “A Voyage to the Islands of St. Martin, St. Eustantia, and St. Christopher, undertaken at the Expence of the Academy of Sciences at Stockholm.”

The island of St. Bartholomew is about four leagues in length, and a league in breadth. Although it abounds with mountains, it is entirely destitute not only of lakes and rivers, but even of springs. The inhabitants preserve the rain-water in cisterns; but are nevertheless obliged to procure water from St. Christopher, for which they often pay twelve livres per ton.

The only port in the island is Le Carenage, near which stands Gustavia, the sole town in the colony. This port is situated on the western side, and has excellent moorings. Vessels, indeed, that draw more than nine feet, cannot enter it; but it will contain an hundred vessels, an advantage that is not to be found either at St. Eustatia or St. Christopher. The bay of Colombier is deep enough

for large ships; but it has no town on its banks. Le Carenage had no town belonging to it before the island was in possession of Sweden.

The climate is in general healthy; but at certain times of the year the weather is variable. During nine-months it is very pleasant; for, though the sun is burning, there is generally a breeze that cools and purifies the air, and is extremely refreshing. If it were not for this almost constant breeze, the climate would be unhealthy. Hurricanes prevail from the middle of July till the middle of October, during which time the wind changes so rapidly as to visit every point of the compass within ten or twelve minutes.

The population of the island is much encreased since it belonged to Sweden. At Gustavia are to be found Swedes, English, French, Danes, Americans, and Jews. With the exception of a very few, the planters are French. The food of the negroes here is so scanty as, in many cases, to be insufficient for nourishment; and their clothing is wretched; indeed it can scarcely be called such, leaving the body exposed to all the evils it can encounter from nakedness, and, among the rest, to the juice of the mancenillier, which corrodes and burns the flesh like aqua-fortis.

The stature of the inhabitants varies according to the different nations from which they are sprung. The natives of the country are strong and robust, but more especially the men. The women are comparatively slight and feeble, which is the effect of the indolent lives they lead. They are never employed in any kind of labour, and remain in a sitting posture during the greater part of the day. If any thing happens to fall from their hand, they call a slave to take it up; and slaves are constantly employed to keep off the flies and insects that would incommode them. The natives are very little subject to illness, and generally live to an old age.

Fresh provisions, flour, dried fish, and salted meat, are brought from the continent of America to this island: and the sea furnishes it with fish of various kinds. They have wheaten bread here, besides a kind of bread peculiar to the country.

The houses are made of wood, and there are but a few that have the lower part of stone. Some of them are raised upon four stone pillars, so that the wind can pass underneath. The windows are simply openings in the wall, with window-shutters, or lattices.

St. Bartholomew, as well as the neighbouring islands, is a magazine for American and European merchandize. Vessels arrive daily to deliver their cargoes, and take in others. The plantations that abound the most there, are those of cotton, which succeed very well. The practice of the planters is to sow four or five grains of the seed in a hole, and when the plants appear, they pluck all up but the strongest. After the first crop they cut down the branches, and the plant pushes out new shoots which bear like the original stem; but, after the second crop, the seeds must be again sown. Aloes are planted round the plantations for fences; they are placed in a straight line, and as close together as possible. When these fences have arrived at maturity, they are impenetrable, either by men or animals. The aloe grows to a great height, and spreads very much, the leaves being often from four to five feet in length. When the aloe has bloomed and borne fruit, it dies; but the planters take care to prevent any void in the fence.

Law-suits, in general, are determined, in this island, according to the Swedish code. There are cases, however, in which the custom of India is followed. As to the punishments inflicted on slaves, almost every proprietor has a different method. The slaves scarcely receiving nourishment to keep them alive, overburthened with labour, and daily receiving strokes of the whip, frequently desert; in which case, the proprietor has a right to inflict discretionary punishment on the slave he recovers. On ordinary occasions, the culprit is laid upon his face on the ground, stripped quite naked, with his hands tied to the wheels of a cannon, and his feet extended and bound to two posts. He who inflicts the punishment, is armed with a whip from twelve to fourteen feet in length, but with a very short handle; he places himself at some distance, and at every stroke, produces a noise like the report of a pistol; and long stripes of skin, and frequently of the flesh itself, are torn off by the whip. The punishment extends to thirty, fifty, and sometimes an hundred, lashes.

The negroes excel in dances, which consist of a great variety of figures and movements of the body, that is difficult, and almost impossible, for Europeans to imitate; even Creoles attain them with great difficulty, while the negroes easily learn European dances. On the last Sunday of every month battles are fought with cocks, which occasion considerable betting.

The coins used on this island are the moidore and piastre; they have also a fictitious money, called the pifovett, which is worth something more than two-thirds of a piastre, and a small silver coin called a dogg, and a coin called a bett, of the value of six doggs. The piales are the most in use. The inhabitants frequently cut them into two or four parts. When they are divided into four pieces, two of them are always larger than the others; the larger are of the value of three betts, and the smaller of two betts and a half.

The author finishes his account with a very long and circumstantial catalogue of the natural productions of the island, which are much more numerous than would be imagined.

OF THE INTRODUCTION OF GARDEN-FLOWERS.

MOST of the flowers introduced into our gardens, and now cultivated either on account of their beauty, or the pleasantness of their smell, have been procured from plants which grew wild, and which have been changed, or, according to the opinion of florists, improved, by the art of the gardener. The greater part of them however came originally from distant countries, where they grow, in as great perfection as ours, without the assistance of man. Though we often find mention of flowers in the works of the Greeks and the Romans, it appears that they were contented with those only which grew in their neighbourhood. The modern taste for flowers came from Persia to Constantinople, and was imported thence to Europe, for the first time, in the sixteenth century. At any rate, we find the greater part of the productions of our flower-gardens were conveyed to us by that channel. Clusius and his friends, in particular, contributed very much to excite this taste; and the new plants brought from both the Indies by the travellers who then continued still more frequently to visit these countries, tended to increase it. That period also produced some skilful gardeners, who carried on a considerable

trade with the roots and seeds of flowers; and these likewise assisted to render it more general. Among these were John and Vespasian Robin, gardeners to Henry IV. of France, and Emanuel Sweert, gardener to the Emperor Rodolphus II. from whom the botanists of that time procured many rarities, as appears from different passages of their works. As this taste for flowers prevails more at present than at any former period, a short history of some of the objects of it may not be disagreeable, perhaps, to many of our readers.

Simon de Tovar, a Spanish physician, brought the tuberose to Europe before the year 1594 from the East Indies, where it grows wild in Java and Ceylon, and sent some roots of it to Bernard Paludanus, who first made the flower publicly known, in his annotations on Linschoten's voyage. The full tuberose was first procured from seed by one Le Cour, at Leyden, who kept them scarce for some years, by destroying the roots, that they might not become common. The propagation of them in most countries is attended with difficulties; but in Italy, Sicily, and Spain, it requires no trouble; and at present the Genoese send a great many roots to England, Holland, and Germany. The oldest botanists classed them among the hyacinths, and their modern name *polianthes tuberosa* was given them by Linnæus in Hortus Cliffortianus.

The auricula, *primula auricula*, grows wild among the long moss covered with snow, on the confines of Switzerland and Steyermark, whence it was brought to our gardens, where, by art and accident, it has produced more varieties than any other species of flower. We do not know who first transplanted it from its native soil. Pluche says only that some roots were pulled up by Walloon merchants, and carried to Brussels. This much is certain, that it was first cultivated with care by the Flemings, who were very successful in propagating it. Professor Weismantel, who deserves to be ranked amongst the principal writers on flowers, says, that the auricula was described and celebrated by Ovid, Pliny, and Columella. Yet the botanists, even of the last century, who searched for plants in the works of the ancients with great diligence, and who took the liberty of making very bold assertions, were not able to find any name that would correspond with the auricula; for the conjecture of Fabius Columna, that it is the *alisma* of Dioscorides, is highly improbable, as that Grecian author extols his plant, which was fond of water, on account of its medicinal virtues only. In the time of Clusius, most of the varieties of the auricula were scarce.

The common fritillary, or chequered lily, *fritillaria meleagris*, was first observed in some parts of France, Hungary, Italy, and other warm countries, and introduced into gardens about the middle of the sixteenth century. At first it was called *lilium variegatum*; but Noel Capperon, an apothecary at Orleans, who collected a great many scarce plants, gave it the name of *fritillaria*, because the red or reddish-brown spots of the flower form regular squares, much like those of a chess-board. It was first called *meleagris* by Dodonæus, because the feathers of that fowl are variegated almost in the same manner.

The roots of the magnificent crown imperial, *fritillaria imperialis*, were about the middle of the sixteenth century brought from Persia to Constantinople, and were carried thence to the emperor's garden at Vienna, from which they were dispersed all over Europe. This flower

flower was first known by the Persian name *tusac*, until the Italians gave it that of *corona imperiale*, or crown imperial. It has been imagined that the figure of it is to be found represented on coins of Herod, and that, on this account, it has been considered as the lily so much celebrated in the scripture.

The Persian lily, *fritillaria Persica*, which is nearly related to it, was made known almost about the same time. The bulbs or roots were brought from Susa to Constantinople, and for that reason it was formerly called *lilium Sufianum*.

African and French marygolds, *tegetes erecta* and *patula*, were, according to the account of Dodonæus and others, brought from Africa to Europe, at the time when the Emperor Charles V. carried his arms against Tunis. This however is improbable; for these plants are indigenous in South America, and were known to botanists before that period under the name of *caryophyllus Indicus*, from which is derived the French appellation *oeillet d'Inde*. Codrus calls them, from their native country, *tanacetum Peruvianum*.

Among the most beautiful ornaments of our gardens, is the belladonna lily, *amaryllis formosissima*, the flower of which, composed of six petals, is of a deep-red colour, and in a strong light, or when the sun shines upon it, has an agreeable yellow lustre like gold. The first roots of it ever seen in Europe were procured in 1593, on-board a ship which had returned from South America, by Simon de Tovar, a physician at Seville. In the year following, he sent a description of the flower to Clusius; and as he had at the same time sent some roots to Bernard Paludanus, and Count d'Aremberg, the former sent a dried flower, and the latter an accurate drawing of it, to Clusius, who published it in 1601. One of the Robins gave in 1608 a larger and more correct figure, which was afterwards copied by Bry, Parkinson, and Rudbecke; but a complete description, with a good engraving, was published in 1742, by Linnæus, who in 1737 gave to that genus the name by which they are known at present. Sweett, Bauhin, and Rudbecke, are evidently mistaken in assigning the East Indies as the original country of this plant; and Broke, who was not a botanist, but only a florist, is equally wrong in making it a native of the Levant. Tover received it from South America, where it was found by Plumier and Barrere, and at a later period by Thierry de Menonville also. At first it was classed with the narcissus, and it was afterwards called *lilio-narcissus*, because its flower resembled that of the lily, and its roots those of the narcissus. It was named *flos-Jacobæus*, because some imagined that they discovered in it a likeness to the badge of the knights of the order of St. James in Spain, whose founder, in the fourteenth century, could not indeed have been acquainted with this beautiful amaryllis.

Another species of this genus is the Guernsey lily, *amaryllis Sarniensis*, which in the magnificence of its flower is not inferior to the former. This plant was brought from Japan, whence it was found, by Kæmpfer, and also by Thunberg, who visited that country about twenty years ago. It was first cultivated in the beginning of the seventeenth century in the garden of John Morin, at Paris, where it bloomed, for the first time, on the 7th of October, 1634. It was then made known by Jacob Cornutus, under the name of *narcissus Japonicus flore rubilo*. After this it was again noticed by our countryman Ray, in 1665, who called it the *Guernsey lily*, which name it still very properly

properly bears. A ship returning from Japan was wrecked on the coast of Guernsey, and a number of the bulbs of this plant, which were on-board, being cast on-shore, took root in that sandy soil. As they soon increased and produced beautiful flowers, they were observed by the inhabitants, and engaged the attention of Mr. Hatton, the governor's son, whose botanical knowledge is highly spoken of by Ray, and who sent roots of them to several of his friends who were fond of cultivating curious plants. Of this elegant flower Dr. Douglass gave a description and figure in a small treatise published in 1725, which is quoted by Linnæus in his *Bibliotheca*, but not by Haller.

Of the numerous genus of the *ranunculus*, florists, to speak in a botanical sense, have obtained a thousand different kinds; for, according to the manner in which they are distinguished by gardeners, the varieties are infinite, and increase almost every summer, as those with half-full flowers bear seed which produce plants that from time to time divide themselves into new kinds that exhibit greater or uncommon beauties. The principal part of them, however, and those most esteemed, were brought to us from the Levant. Some were carried from that part of the world so early as in the time of the crusades; but most of them have been introduced into Europe from Constantinople since the end of the sixteenth century, particularly the Persian *ranunculus*, the varieties of which hold at present the first rank. Clusius describes both the single and the full flowers as new rarities. This flower was in the highest repute during the time of Mahomet IV. His grand vizir, Cara Mustapha, well known by his hatred against the Christians and the siege of Vienna in 1683, wishing to turn the sultan's thoughts to some milder amusement than that of the chase, for which he had a strong passion, diverted his attention to flowers; and, as he remarked that the emperor preferred the *ranunculus* to all others, he wrote to the different pachas throughout the whole kingdom to send him seeds or roots of the most beautiful kinds. The Pachas of Candia, Cyprus, Aleppo, and Rhodes, paid most regard to this request; and the elegant flowers which they transmitted to court were shut up in the seraglio as unfortunate offerings to the voluptuousness of the sultan, till some of them, by the force of money, were at length freed from their imprisonment. The ambassadors from the European courts, in particular, made it their business to procure roots of as many kinds as they could, which they sent to their different sovereigns. Marseilles, which at that period carried on the greatest trade to the Levant, received on this account these flowers very early, and a person there, of the name of Malaval, is said to have contributed very much to disperse them all over Europe.

PROGRESS OF THE POPULATION OF LONDON PREVIOUS
TO THE TIME FROM WHICH THE BILLS OF MORTALITY
COMMENCED.

THE time of the foundation of London is naturally involved in obscurity: it most probably must look for its origin to a few miserable huts of the first inhabitants of the island, whom the advantages of the situation drew together, and who little thought, when they reared their rude habitations, that the infant villages would,

would, in time, become the metropolis of England, and one of the most considerable cities of the world. If it existed at all at the time of the invasion under Julius Cæsar, it was too insignificant to attract his notice; but within a century from that time, it became a place of some consequence, and probably of considerable extent; for in the year 62, Suetonius found his army, which is said to have consisted of 10,000 men, insufficient to defend it, and was obliged to abandon the city to Boadicea, by whom it was reduced to ashes, and all the inhabitants massacred.

The local advantages which had induced the first inhabitants to make choice of this spot, had the same effect upon others, and the new settlers continued gradually to increase so much, that after the settlement of the East Saxons it became the chief town of their kingdom. In the year 798, London, with many of its inhabitants, was destroyed by fire; and in the next century it suffered much from the depredations of the Danes till the year 886, about which time it was repaired by Alfred, who afterwards made it the capital of all England. Under the care of this monarch, it was, in 895, so far recovered from the devastations of the Danes, as to be capable of sending out forces against them. In 982, the city was again destroyed by fire; but in eleven years after this calamity, it was able to send out a fleet against the Danes, and to defend itself effectually when besieged by them. From this period to the time of the Norman invasion, it was frequently attacked by the Danes, but without success; and, as this caused the people of the neighbouring villages to consider it as a place of security, it must have contributed to increase the number of its inhabitants; the growth of the city was, however, frequently checked by the ravages of fire, particularly in 1077, 1087, and 1092, when it suffered severely from that calamity; to which, like all other large cities consisting of ill-constructed wooden houses, it was in continual danger of becoming a prey.

About the year 1140, according to Peter of Blois, London contained 40,000 inhabitants. If the accounts of W. Fitz Stephen were to be depended on, the population must have been much greater; but, as he appears to have paid little attention to correctness into her particulars, his assertions in this respect may be justly doubted. Considering the number just mentioned as the nearest to the truth that can be now ascertained, it will appear, that in the course of the next two hundred years, notwithstanding some severe calamities, the population must have increased very considerably, otherwise the loss of more than 50,000 inhabitants, who were carried off by the plague which broke out towards the end of the year 1348, would have entirely depopulated the city. The privileges granted by Henry III. and several of his successors, probably allured great numbers from the country, and from foreign parts, to settle in London; and, had it not been continually subject to pestilential diseases, the increase of inhabitants must have been very rapid.

In 1407, about 30,000 persons are said to have died of the plague in London, and nearly as many in 1478 by the same disorder. In 1485, the epidemic disease called the sweating sickness raged with violence; and in 1499, the plague again swept away 30,000 persons. The frequent returns of this terrible scourge seem to warrant a suspicion, that in some instances it was engendered by the filthy and confined state of the metropolis, which at least must have considerably encreased

encreased its malignity, and prolonged its continuance. At length some steps were taken for putting a few of the principal streets into a better condition; in 1533, an act was passed for paving the high-street from Holborn-bridge to Holborn-bars; the streets of Southwark were, by the same statute, also directed to be paved, and every person was to maintain the pavement before his own ground, or forfeit sixpence for every square yard. A similar act was passed in 1541, directing the following streets to be paved, viz. the street leading from Aldgate to Whitechapel church; the upper part of Chancery-lane; the way leading from Holborn-bars westward, towards St. Giles's in the Fields, as far as there were any houses on both sides of the street; Gray's-Inn-lane; Shoe-lane, and Fetter-lane; which are all described as "very foul, and full of pits and sloughs; very perilous and noisome, as well for the king's subjects on horseback, as on foot, and with carriages." Another act was passed about three years after, for paving several other streets in the out-parts of London; and in each instance it was done, not by a rate or assessment, but by obliging the owners of the lands and tenements adjoining the streets to pave the length of their property, and put it annually in repair. This attention to the state of the ways seems to indicate an increase of the traffic and wealth of the city, and therefore probably also of the number of inhabitants.

From the map of London about the year 1558, republished by Mr. Nichols, in his Collection of the Progresses and public Processions of Queen Elizabeth, it appears that at that time there were few houses at Charing-crofs; and, though the Strand was built on each side, open fields extended behind it from St. James's Park to Holborn, almost down to Chancery-lane. At Moorgate there were but few houses without the city wall, or in the now populous parish of Shoreditch; still less in Spitalfields, Bethnall-green, &c. Though so much less extensive than at present, it appears to have been far more unhealthy, as it was seldom long free from the plague, in a greater or less degree. In 1563, there died in the city and liberties, containing 108 parishes, of all diseases, 20,372 persons, of which number 17,404 died of the plague; and in the eleven out-parishes, there died of all diseases 3288 persons, of whom 2732 died of the plague; in the whole, therefore, there died of the plague 20,136, and of other disorders 3524: the latter number, however, must have been much less than the usual number of deaths in the years free from the plague; from which it may be presumed, that the whole number of inhabitants at this period could not be less than 110,000. In 1564 the plague ceased; and, though it has always been found that the population of London has recovered very speedily from the effects of this calamity, its restoration must, in this instance, have been considerably promoted by the settlement of many of the French and Flemish Protestants, who took refuge in this country, and, by the improvements they introduced in many of the arts and manufactures, contributed much to draw additional hands to London and other manufacturing towns. In 1567, there were found, on enquiry, to be 4851 strangers of all nations, in London; and, on a similar inquisition, taken in 1580, of all foreigners residing in the city and liberties, they were found to be 6492. It appears that at this time the suburbs of the city were increasing considerably, as it was thought necessary to issue a proclamation, forbidding any build-
ings

ings to be erected on new foundations, within three miles of the city gates, and ordering that only one family should inhabit each house.

On the plague breaking out again in March, 1592, a regular account of the number of deaths was begun; and in 1594 the weekly bills of mortality were first published, probably to convince the people of the decrease of the plague, as they were discontinued as soon as it entirely ceased; the number of persons that died of the plague in 1592, was 11,503; and in the following year, 10,662. Its re-appearance seemed to the parliament to justify the apprehensions that had been entertained of the ill consequences of the increase of the metropolis; they accordingly enacted, that no new buildings should be erected within three miles of London or Westminster, nor any one dwelling-house converted into more; that there should be no inmates or under-sitters, and that commons or waste lands lying within three miles of London should not be inclosed.

On the plague increasing again in 1603, another proclamation was issued, for more effectually restraining the increase of the city; and the publication of the bills of mortality was renewed, which has been regularly continued ever since. These bills, though very deficient and incorrect, are almost the only documents from which any estimate of the population of London can be formed; but, though they are too incomplete to furnish the means of determining with accuracy the whole number of inhabitants, they shew with much greater certainty the increase or decline of the population, from the period of their establishment to the present time.

HOOLE's TRANSLATION OF LEEUWENHOEK, No. III.

OF THE GARDEN SPIDER.

THE following observations were made on those kinds of spiders which are found in gardens, where they fix their webs to vines, herbs, and shrubs.

I have often seen these spiders, when dropping, or falling, as it seemed, from a tree, stop or support themselves in the midway, by means of their thread; and I found that this was done by the help of one of their hind feet, which they continually apply to the thread as they spin it. These feet are each of them furnished with three nails, or claws, standing separate, or apart from each other. Two of these claws are at the extremity of the foot, and formed with teeth, or notches, like the cuts in a saw, growing narrower towards the bottom; and with these they are enabled to hold fast the thread, in like manner as the pulley or wheel, in thirty-hour clocks, is contrived to lay hold of the clock-line, by means of the groove being also narrow at bottom: the third claw is destitute of teeth or notches, but serves for various uses to the animal; and this is always to be noted, that when the spider does not want to ascend to an height, but only to lay hold of the web it has spun, it always uses this claw for that purpose.

The kind of spider I am now describing, has the hind part of its body much larger than is seen in other spiders; it is provided with eight longer and two shorter legs, which shorter ones are placed in the fore part of its body on each side of the head, and all furnished with

with an indented or notched claw as before described. Some will have it, that spiders have no more than eight legs, but this appears to be a mistaken opinion.

In these spiders I plainly perceived eight eyes, two of which are placed near to each other at the top of the head, and, in my judgment, designed to see those objects which are above the animal. Two others of them are situated a little lower down, in order to discover all objects in front; and on each side of the head are a pair of eyes close to each other, and of these, the two which stand forward are to take in the view of all objects lying obliquely, or not straight in front; and the two which stand backward, are undoubtedly designed to behold all objects behind the animal. And if we consider that the pupils of these eyes are immoveable in the head, we may easily conclude, that this number is necessary, for enabling the spider to behold all circumjacent objects, and to go in search of food.

I have often heard it said, that the spider has a sting, with which, it is also reported, it can kill the toad: but, no one could tell me in what part of the body this sting was placed, therefore, I concluded, that, if there was one, it must be in the posterior or hind part as in other animals and insects; but, on examination, I found this opinion to be groundless. The spider is, however, provided with two organs or weapons answering every purpose of a sting, which are placed in front of its head just below the eyes, and, when not in use, they lie between the two shorter feet. These weapons or instruments of offence, which are bent in the nature of claws, are very similar to the sting of the scorpion and the fangs of the millepede of India, and in each of these fangs (for so I will call them) is a small aperture, through which, in all probability, a liquid poison is emitted by the spider at the time it inflicts the wound. [Dr. Mead, in his celebrated Essay on Poisons, when treating of the spider, expressed his doubt of this fact, by reason that he could not himself discover the aperture; and Mr. Henry Baker, in his Treatise on the Microscope, concurred in opinion with the doctor, that Mr. Leeuwenhoek must have been mistaken in this particular. But in another treatise, afterwards published by Mr. Baker, he informs his readers, that he had at length plainly perceived the aperture, and had shewn the same to Dr. Mead, who was much pleased with the discovery. A testimony this, greatly to the honour of our author.]

I at several times inclosed two or three large spiders in the same glass, and always found that when they approached each other they would fight to that degree, as to be covered with the effusion of blood from their bodies. I also observed, that the smaller spiders always avoided the larger; but, when two of nearly equal size approached each other, neither would give way, but both of them grappled together furiously with their fangs, till one of them lay dead upon the spot, its body being as wet with the blood flowing from the wounds received, as if water had been poured upon it. I at one time had a spider which was wounded by the bite of another in the thickest part of its leg, and from the wound there issued some blood, in quantity, about the size of a large grain of sand; this wounded leg, the spider held up, as unable to use it, and soon afterwards the whole leg dropped from its body: whenever the breast or fore part of the spider was wounded, I always observed the wound to be mortal. [If any reader should be disposed to try the experi-

ment

ment of setting spiders to fighting, he must not expect to see a red liquor issue from the wounded spider; for the circulating fluid in many insects is clear or colourless; though as fitly to be denominated blood, as that which flows in the veins of animals.]

I had imagined, that, when a spider applied its thread either to some foreign substance or to another thread, that the thread newly spun must be covered with some viscous or glutinous matter by which it became fastened, in like manner as we observe in silk-worms threads. But I now found that the spider cannot fix its thread to any thing, without imprinting the hind part of its body on the place, by which pressure, it emits an incredible number of excessively small threads, diverging in every direction, from whence we may conclude, that, as soon as the threads are exposed to the air, they lose their viscosity or gluey quality. When I at first began the dissection of the spider, and endeavoured to discover the viscous or gummy substance from whence these threads proceed, and could not satisfy myself in that particular, I was astonished, not being able to conceive how, from so moist a body as this creature's, there could in so short a time be produced threads strong enough to bear the weight, not only of one, but of six spiders at a time. And, upon endeavouring to discover the texture of these threads, I could at that time perceive no more, than that the same thread appeared in some places to be one and entire, and in others to be composed of three, four, or more, threads; and, though I often endeavoured to observe those threads immediately as they issued from the spider's body, I could not obtain a perfect view of them, notwithstanding which, I did not doubt, that what is commonly supposed to be one thread, is, in fact, composed of many. I determined therefore, so to fix a spider on its back, that it could not move the hind part of its body; and, this being done, I contrived with a small pair of pincers to draw out from the body, that small part of the thread which projected from the organ or instrument from which the threads proceed, and then I perceived a great number of exceeding small threads issue forth, which, when at about one or two hairs breadth distance from the spider's body, united in one or two threads, and that in this manner the larger threads were composed. Not content with these observations, I set about devising means of keeping the threads separate, as they issued from the spider's body, so that I might be able to give some representation of their inconceivable fineness, and at three several times I succeeded herein to my wish. But yet, this fineness cannot by any efforts of the pen or pencil, be adequately described. For upon applying the utmost magnifying powers of the microscope, threads are discovered so exquisitely slender, as almost entirely to escape the sight. I have sometimes endeavoured to count these threads as they issued forth, but always without success.

If we duly consider that the threads of spiders, which to the naked eye seem to be single, are composed of many smaller ones, and that they thence acquire the strength we observe them to have, we shall more than ever be assured, that no flexible bodies (except those made of metal, the component particles of which are, by the force of fire, most closely compacted or knit together), can have any great strength or toughness, unless they are composed of oblong parts laid side by side, and that their strength or toughness will be greater where these oblong component parts are twisted to-

gether, or made to cohere by some glutinous matter, as are spun silk, linen garments, ropes, and the like. And this is the reason why all the single threads of flax are very tough in proportion to their size, for each of them is composed of still smaller particles or fibres, which are not only joined together by a certain viscous or gummy matter, but are also surrounded with a coat or bark, as it may be called; whereby their inward component fibres are rendered still stronger.

Again, if we advert to the great number of excessively slender threads, proceeding all at the same time from the body of the spider, we must acknowledge that this kind of formation is necessary; for, were it a single thread which is spun by this creature with such celerity, the liquid matter of which it is formed could not, on its exposure to the air, become a solid substance so quickly as these minute threads, an hundred or more of which, taken together, do not in my opinion equal the hundredth part of one of those hairs I can take from the back of my hand.

In a word, the inscrutable power and wisdom of the Almighty Creator are manifestly displayed in the formation of such a thread as the spider's, the wonderful make of which is seldom observed, because, the fineness and delicacy of its texture are not discernible by the naked eye.

Upon beholding the exquisite slenderness, and also the multitude, of these threads, I was struck with astonishment, upon considering how wonderful must be the organs in a spider's body to produce so many, and at the same time all distinct from each other. And, although I never expected that I should be able to dive into this secret of nature, yet, upon dissecting the hind part of one of the largest spiders I could procure, and attentively examining it, I at length, with the greatest admiration, perceived a great number of excessively small organs, from each of which, one exquisitely fine thread proceeded, and these were so many, that I thought their number must at least exceed four hundred. They were not all placed close together, but in eight distinct spots or compartments; so that, if the spider uses all these organs at the same time, eight several threads may be formed, each of which will consist of a great number of smaller ones. Again, these smaller threads differ in size, for one of the organs will be seen to spin a thread twice as large as the next adjoining to it.

If any person examines by the microscope that part towards the extremity of the spider's body from whence its thread proceeds, he will observe the spot to be, as it were, surrounded by five several protuberances or risings, each ending in a point, and altogether forming a kind of enclosure; but from the anterior or forwardest of these five protuberances no threads proceed. The other four on their outer sides are thick set with hairs, so that all the smaller organs destined to spin the threads are situated towards the inside, the reason of which I take to be, that they may be preserved uninjured when the spider is creeping into holes where it does not want to spin its web, or while running along the ground, or after its prey. When these last-mentioned four protuberances are put aside from each other, there will be seen in the middle or space between them four smaller ones, each furnished with the like organs for spinning threads, but smaller in size and fewer in number. These organs for spinning,
being

being by this means all exposed to view, exhibit the appearance, as it were, of a field, thick set with an incredible number of pointed parts, each producing one thread; but these pointed parts are not made gradually tapering from the base to the point; they are formed, as if one were to imagine a small reed somewhat tapering, having a still smaller one joined to its taper end, and this latter terminating in a point, which point, in these organs I am now describing, is as fine as imagination can conceive.

Now if we lay it down as a fact, that a young spider, which is several hundred times smaller than a full grown one, is furnished with the same organs as the larger, and that as the spider, so the organs do by degrees grow proportionably larger, the necessary conclusion is, that the threads spun by a young spider, are many hundred times finer than those spun by one full grown, which exquisite slenderness it seems beyond the power of the human mind to form a true idea of.

After this, I took a small frog, whose body was about an inch and an half in length, which I put into a glass tube together with a large spider, in order to see the actions of these two animals when brought together; and I observed the spider pass over the frog without hurting it, though with its fangs displayed as if to attack the frog. Upon this, I caused the frog to fall against the spider, who, thereupon, struck his fangs into the frog's back, making two wounds, one of which exhibited a red mark, and the other a purple spot. I then brought the frog to the spider a second time, who, thereupon, struck his fangs into one of the frog's fore feet, whereby some few of the blood vessels were wounded. Having provoked the spider a third time, he struck both fangs into the frog's nose, presently after which, I took the spider out of the glass. The frog, thus wounded, sat without motion, and, in about the space of half an hour, it stretched out its hind legs and expired. The next day I brought another frog, about the same size as the former, to the same spider, but, though it was twice wounded, I did not perceive it to be injured; perhaps because the spider's bite may not be so venomous in our climate as in warmer regions, or else that the poison of this spider might have been exhausted by former attacks.

Towards the end of October, I took several of the largest spiders that could be got, and placed them in glasses apart by themselves, in order to wait for their laying eggs, which I purposed to open, and examine the contents. Two of these spiders, after being confined ten or twelve days, I found had laid their eggs, and enveloped them in so thick a web, that I was astonished to behold it, considering that it had been spun in a few hours space. Some of these eggs I opened, and found the inside to be of a yellowish colour; the form of each egg was almost round, and nearly the thirtieth part of an inch in diameter, and the whole collection of eggs laid by one spider composed a rounding figure, almost spherical, nearly half an inch in diameter, from whence may be computed how great a number of eggs the spider lays. And one would almost think it impossible for so many to be contained within this creature's body; since upon viewing them with the naked eye, as they lie together in regular order, they occupy a larger space than the size of the animal itself. But it must be considered, and it is what I have often experienced in opening spiders, that the eggs while within their bodies are not of a globular figure, but being very soft they lie compressed together,

and therefore are of divers shapes, but as soon as emitted from the spider they assume a spherical form, by reason of the equal pressure of the atmosphere on every part of them; and when of this round figure, being placed in exact order, side by side, and only touching each other in a point, they must necessarily, to our view, occupy more space than they did while in the animal's body.

I at first was not able to conceive by what means the spider could place its eggs so exactly in the centre of the web; but now I was satisfied in that particular; for, while I was observing a third spider which was fixing a web to the glass in order to lay her eggs in it, I saw that first she made a kind of thick layer of threads, and fastened them to the glass before she began to lay one egg; and it was most worthy of remark, that this layer or stratum was not flat, but curiously made with a roundish cavity. In about three quarters of an hour's space, upon again observing the spider, I saw that this cavity was not only filled with eggs, but that eggs were piled up above the edges of it to the same height as the hollow of the cavity below, and the spider was then busied in spinning a web to enclose the eggs on every side. For this purpose she employed not only the hind part of her body from whence the threads were spun, but her two hinder feet, with which she placed the threads in due order. And now all the organs used in producing the threads appeared in view, each of them in the act of emitting its particular thread. I also observed the spider elevate the hind part of its body about the breadth of a straw, and then fix the thread which by the elevation had been drawn out to that length, to the web which was already spun about the eggs.

I was very desirous to see a spider in the act of laying its eggs, which at length I obtained a sight of, and observed that they were not emitted from the same part as is usual in all other minute animals; but from the fore part of its belly, not far from the hind legs; and near the place I observed a kind of little hooked organ, handsomely shaped, which I had often before seen in this animal, and could not imagine for what purpose it was designed; but now I perceived, that it extended over that part whence the eggs issued, and I therefore conjectured that its use was to deposit them in regular order within the web prepared to receive them.

On the first of January, I put some spider's eggs into a glass tube which I constantly carried about me, in order to discover whether by the warmth I imparted to them they would be hatched sooner than the usual time, which is in the spring; and on the 17th of January I saw above twenty-five young spiders completely hatched, and as many more half-way out of the eggs; and in the evening of the same day I counted above an hundred and fifty young ones. The next day, the number was not increased, for the remainder of the eggs, to the number of fifty, or thereabouts, were either barren, or the young spiders were dead within them. Upon exposing the glass tube at this cold season, to the air for about a quarter of an hour, the young spiders lay without motion, but, upon applying some warmth to it, they began to move, and the greater number of them crowded themselves together in an heap, after the manner of bees, within the web where the eggs had been. On the 21st of January I could discern eight eyes in each of them, which till then had not been visible, and on the 25th of January they began to spin webs in the same manner as full-grown spiders. I had hitherto been at a loss to conceive

conceive how this great number of young spiders could be supplied with nourishment, considering that the natural food of this creature is the substance of other insects; but I now perceived that they had fed on the barren eggs which had been left in the glass, and they afterwards devoured one another till they were reduced to a very few in number.

I have often compared the size of the thread spun by full-grown spiders with a hair of my beard. For this purpose I placed the thickest part of the hair before the microscope, and, from the most accurate judgment I could form, more than an hundred of such threads placed side by side could not equal the diameter of one such hair. If then we suppose such an hair to be of a round form, it follows that ten thousand of the threads spun by the full-grown spiders when taken together, will not be equal in substance to the size of a single hair. To this, if we add that four hundred young spiders, at the time when they begin to spin their webs, are not larger than a full-grown one, and that each of these minute spiders possesses the same organs as the larger ones, it follows, that the exceeding small threads spun by these little creatures, must be still four hundred times slenderer, and consequently that four millions of these minute spiders threads cannot equal in substance the size of a single hair. And, if we farther consider of how many filaments or parts each of these threads consists, to compose the size we have been computing, we are compelled to cry out, O what incredible minuteness is here; and how little do we know of the works of nature!

I never could procure a sight of these animals when coupling together, either in the gardens or fields, nor when inclosed in glasses, for I always perceived the female to run away at the approach of the male; and, having at one time inclosed three male spiders with a female in one glass, the female flew at the males with so much fury, and wounded them to such a degree, that blood issued from their legs and feet. Hereupon I killed the female, and the next day I saw two of the males lie dead, and the survivor employed in devouring the dead female.

These are the chief of my observations on the spider, an animal held in such detestation by many, that they dread even the sight or approach of it, but in which we find as much perfection and beauty as in any other animal.

TO PREPARE AURUM FULMINANS.

IF gold be dissolved in aqua-regia, and precipitated with volatile lixivious salt, or with fixed lixivious salt, when the aqua-regia has been prepared with sal ammoniac, a yellow powder will be obtained, which, when heated, or only bruised, explodes suddenly with a prodigious report. The force of this aurum fulminans is terrible, and, in the hands of incautious persons, has often occasioned much mischief. But, however powerful, it cannot, as some have imagined, be employed instead of gun-powder, even were not this impossible on account of the high value of the metal from which it is made; for explosion does not take place when the powder is confined. Phænomena of this kind are always of importance, and afford subject of speculation to the philosopher, though no immediate use can be made of them. Experiments, however, have rendered it

it probable that this powder may possess some medicinal virtues, and we are assured that it can be employed in enamel painting.

The period when this powder was invented is uncertain as the accounts given of its composition. It is, however, probable that the discoverer was a German benedictine monk, who lived about the year 1413; and there is reason to think that he may have made many useful observations, of which we are yet as ignorant as of the meaning of the Egyptian hieroglyphics; for both are almost equally unintelligible, though some, who possess more imagination and credulity than judgment, think they understand and can explain them. The Egyptian hieroglyphics are indeed totally incomprehensible, but those of Valentin only in part; for, when new observations have been made respecting gold, they have been found afterwards in the works of Valentin, in a passage which no one before could understand. In this case these writings are of no more utility than the answers of the ancient oracles, which were comprehended when a knowledge of them was no longer necessary, and which misled those who supposed that they comprehended them earlier. But the account of aurum fulminans in Valentin is so uncommonly intelligible, that it almost seems he either wrote in an explicit manner without perceiving it, or that the words escaped from him contrary to his intention. As the work in which it may be found, is scarce, we shall transcribe the prescription.

“Take a pound of aqua-regia made with sal ammoniac; that is, take a pound of good strong aquafortis, and dissolve in it four ounces of sal ammoniac, and you will thus obtain a strong aqua-regia, which must be repeatedly distilled and rectified, until no more feces remain at the bottom, and until it become quite clear and transparent. Take fine thin gold-leaf, in the preparation of which antimony has been used; put it into an alembic; pour aqua-regia over it; and let as much of the gold as possible be dissolved. After the gold is all dissolved, add to it some *oleum tartari*, or *sal tartari* dissolved in a little spring-water, and it will begin to effervesce. When the effervescence has ceased, pour some more oil into it; and do this so often till the dissolved gold fall to the bottom, and until no more precipitate is formed, and the aqua-regia remains pure and clear. You must then pour the aqua-regia from the gold calx, and wash it well with water eight or ten times. When the gold calx is settled, pour off the water, and dry the calx in the open air when the sun shines, but not over the fire; for, as soon as this powder becomes a little heated or warm, it explodes, and does much mischief as it is so powerful and violent that no man can withstand it. When the powder has been thus prepared, take strong distilled vinegar and pour over it; keep it continually over the fire for twenty-four hours, without stirring it, so that nothing may fall to the bottom, and it will be again deprived of its power of exploding; but take great care that no accident happen by carelessness. Pour off the vinegar, and, having washed the powder, expose it to dry.”

The latter part of the receipt shews that Valentin had made experiments in order to discover how aurum fulminans might be deprived of its power of exploding, and he found that this could be done by vinegar. It appears from his writings, that he had discovered also that the same thing could be effected by sulphur.

After

After the time of Valentin, Crollius, who lived in the last half of the sixteenth century, seems to have been best acquainted with this powder, and to have principally made it known: at any rate his works are referred to by most of the modern writers. He calls it *aurum volatile*, and speaks of its being useful in medicine. The name *aurum fulminans* was first used by Beguin. The method of preparing it is described by Kircher, who considers it as a thing uncommon, and who calls it *pulvis pyrius aureus*.

ON THE USE OF WIGS.

THE Greeks and Romans used false hair, and had likewise a kind of hair-powder. Hannibal wore false hair.—Lampridius gives a description of the Emperor Commodus's wig, which was powdered with gold-dust, and anointed with ointments of an agreeable odour, that the dust might adhere to it. It appears not improbable, that, even then, not merely a vain affectation of pomp, but the effects of too active a gallantry (though trifling when compared with those of more modern times) may have given occasion to this invention. For farther information on this subject, we refer the reader to the learned commentators on the satirical exclamation of Cæsar's soldiers, during his triumphal entry into Rome: "*Urbani, servate uxorem, mæchum calvum adducimus!*" Henry III. king of France, lost his hair through the then yet new-fashioned venereal disease (although, indeed, his grandfather had already been infected with it); he had therefore one of the caps, then usually worn, covered with false hair; but yet he ventured not to take off his hat in the presence of his queen, or of the foreign ambassadors, for fear they should observe his loss. In 1518, John duke of Tuscany ordered his head-bailiff at Cobourg to procure for him from Nurnberg a handsome false head of hair; "but secretly (wrote he), that it may not be known that it is for us; and let it be curled, and so contrived that it may be put on the head without being observed." But in the reign of Louis XIV. when polite manners and gallantry had become more general, men more sensibly affected with cold, &c. and the number of bald heads greater; they were no longer ashamed of the caps covered with false hair; many people even, who had not lost their hair, wore them from an affectation of fashionable gallantry, from the effects of which they were really exempt. This gave rise to the idea, of weaving hair into a linen cloth, and likewise into fringes, which were used for some time under the name Milan Points. These fringes or laces were sown in rows to the plain caps, which were now made of a thinner sheepskin; and this head-dress was called by the French *peruque*, by the Germans *parucke*, by the English *periwig*, contracted into *wig*.—At last they invented a kind of three-thread tresses, which were sewed to ribbons or other stuffs; these they then stretched out, and joined together on blocks cut into the shape of the head. This is the origin of our present wigs, the making, repairing, and dressing, of which furnish employment to so vast a number of people. The first who wore a *peruque* was an abbé named La Riviere. At one time this ornament of the head was so thick, so loaded with hair, and so long, that it hung down as low as the waist. A person who happened to have a lean visage was quite hid in this cloud of hair. The fore-
part

part of the wig was likewise worn very high: in France this was called *devant à la Fontagne*, from the marquis of that name, who had brought it into vogue in the time of Louis XIV.—A certain Ervais at last found out the art of frizzing the wigs; by which means, with a small quantity of hair, they appear fuller than they could be with even a much greater. The bag-wigs first came into fashion during the regency of the Duke of Orleans, and thence obtained the name of *peruques à la Regence*. The Emperor Charles VI. would allow no one to be admitted into his presence without a wig with two tails. Of a more modern date than wigs is our present hair-powder. In the reign of Louis XIV. it was not yet in general use; and that king at first disliked the fashion of wearing it. The players are said to have first powdered their hair; but, for a long time after the introduction of that practice, always combed the powder out again, as soon as they returned from the theatre.

VAPOUR MACHINE FOR RAISING WEIGHTS.

AT Chaillot, near Paris, at the forges of Messrs. Perrier, an experiment was made on the 13th of Nov. 1799, of a machine of their invention, for raising coals from coal-mines.

The vapour machine, or fire-pump, has been long since employed in the working of those mines, to drain the water. Those learned mechanics therefore imagined that the same advantage and the same economy might be found in drawing up the coals, by substituting the new vapour-machine, called a rotation-engine, instead of horses, which are commonly used for that purpose, but, to accomplish that end, it was necessary to compose that machine in such a manner that it might have the faculty of obeying its conductor, of changing its movements at pleasure, in order to raise the ton with coals, which is loaded at the bottom of the pit, and to let it down again when empty, and of stopping it at the height required, when it is necessary to send down workmen to mend the wood-work of the pit; it was farther necessary, in order to render the resistance which that machine had to overcome, uniform, to annihilate the weight of the cord, which becomes very heavy when the pits are of a great depth. They have accomplished all those points by a very simple mechanism, which any man may be made acquainted with in a few minutes.

The experiment which has been made has proved that a ton of coals, consumed in the furnace of that machine, would draw up, in the same space of time, about 100 tons of the same weight, from a pit of 150 metres in depth, and in proportion from pits of a greater or smaller depth.

The Paris Commercial Journal, in giving an account of this invention, observes, that it will occasion a considerable saving in the working the coal mines, and produce a diminution in the price of that article of fuel, so necessary to the arts; and farther that, if it be adopted, the persons who work the coal mines will draw from the bowels of the earth, without consuming the produce of its surface, all the means which are necessary; they will restore a great number of horses to commerce and agriculture. The working of the mines of Anzin, near Valenciennes, employs four hundred and fifty horses, which would be saved.

FOTHERGILL ON THE HYDROPHOBIA.

DR. Fothergill's Paper, "On the nature of the disease occasioned by the bite of a mad-dog, the means of an effectual remedy," is one of those tracts, the general dispersion of which might be highly useful. The description of the disorder is tremendous; the remedy recommended is principally olive-oil, operating by producing copious perspiration. The doctor also suggests the possible effects of music in the cure or alleviation of this dreadful malady. The following extract from this paper cannot but be useful and interesting:

It appears that the hydrophobia may be considered as a species of spasmodic *angina*, produced by specific contagion, which exerts its influence, 1st. On the injured part, and afterwards on the organs of deglutition. 2dly. That the local stimulus, being propagated to the brain, excites the moving powers of the system into re-action; and hence the convulsive motions which speedily exhaust the strength, and finally extinguish the vital principle. 3dly. That profuse bleeding may prove highly injurious. 4thly. That the forcing down large quantities of liquid is a cruel practice, as it cannot but increase the spasms, and exasperate the malady.

The chief indications of cure appear evidently to be the following:—1st. To dissolve the fatal connection between the injured part and the organ of deglutition. 2dly. To calm the violent spasms, and soothe the nervous system. 3dly. To support the strength, and invigorate the whole frame.

To answer the first of these indications, much depends on external means, and close attention to the injured part. The moment any darting pains, attended with numbness and discoloration, are perceived, they denote the poison to be in an active state, and that no time ought to be lost in prosecuting the most vigorous measures.

The period from the commencement of these symptoms to the approach of the hydrophobia is uncertain, and perhaps rarely exceeds five or six days. To prevent, therefore, the initiation being propagated to the throat, let the suspected part be immediately cut out, and the surface of the wound duly cauterized. If any difficulty of deglutition has already been felt, let a sharp blister or sinapism be applied to the throat, extending from ear to ear. For unless the morbid impression can be obliterated by one yet stronger, and the natural action of the sympathizing parts speedily restored, there can be but small hopes of success.

A malady so rapid in its progress, so intractable by nature, demands herculean remedies, and warrants a prudent trial of the most active substances, with which we are yet acquainted. The *Atropa Belladonna*, in doses of four or five grains, has been highly extolled by some German professors; the *laurocerasus* half grain, and arsenic one-eighth, by others. The *byoscyamus niger*, in form of extract, given in doses of fifteen or twenty grains, in cases of fixed melancholy, attended with horrors and obstinate watchings, I have sometimes found very beneficial. It moreover procures sleep and composure of mind; often where opium fails, or even adds to the inquietude. Now these potent remedies, with due caution, may be tried in succession; if they fail, they only share the common fate of former antidotes; but, if one of them should answer, it may afford an important addition to our stock of knowledge.

adly. To alluage the spasms, and soothe the nervous system.—To effect this, after the hydrophobia has actually appeared, all impediments, and whatever may hurt the acute feelings of the patient, or by the power of association tend to aggravate his sufferings, must be first carefully removed; no dog must on any account be allowed to enter the room. Not water only, and other liquids, but all glaring colours and glass mirrors, must be kept entirely out of his sight. No loud noise, nor cold air, must be suffered to molest him. Having thus removed impediments, we must next endeavour to assist nature, in alleviating the spasms, and in procuring a lucid interval. If there be any critical evacuation in this disease favourable to our views, it must, I conceive, be that of sweat.

In the cures recorded by Dr. Nugent and others, in five or six cases of the hydrophobia in an advanced state, the treatment was different in each, yet there was one circumstance common to all, and that was a copious sweat. Till that appeared, the recovery seems to have been doubtful. Nor is the case described by Van Helmont an exception: the patient being plunged in the cold-bath till half dead, the cure was attributed to the fright, but ought rather to have been ascribed to re-action of the system, which, being aided by a warm bed and sudorific regimen, terminated in a salutary sweat. In a subsequent experiment of this kind, equally terrific, no sweat ensued, and the disease soon proved fatal.

Sudorifics, indeed, seldom produce a copious sweat, unless their operation can be assisted by warm diluting liquors. Hence, perhaps, it is, that musk, valerian, opium, and other powerful sudorifics, have so often failed.—Given merely as antispasmodics, without proper dilution, they serve but to flatter hope at the expence of disappointment; let, therefore, the following method have a fair trial:

In a pint of olive-oil dissolve an ounce of camphire; let the entire surface of the body be diligently rubbed with this solution, made warm, continuing the friction before a gentle fire till the whole be expended. After which, let the patient be covered with a flannel and put into a warm bed, till a copious perspiration be procured. This may be encouraged by an enema of warm wine whey, with an addition of volatile alkaline spirit, or *eau de luce*, which last has long been deemed a noted specific in France.—The part affected, and also the neck and spine, ought to be well embrocated twice a-day with tepid-oil, which, by soothing the nerves, may act as a powerful anodyne and antispasmodic: could an entire bath of oil be had, it would be, perhaps, greatly preferable to a common bath of warm water.

A patient, in consequence of the poison of arsenic, had long suffered severe pains and convulsive spasms over the whole surface of his body, which resisted various internal and external remedies, till he was ordered by M. Bouteille, to be placed, for the space of an hour, at proper intervals, in a bath of warm oil, by which he was soon completely cured.

If music has charms to harmonize the nerves, and soothe the feelings of a melancholy or outrageous maniac, as mentioned on the highest authority, can any cause be assigned why, in a musical age like the present, its powerful influence should not be tried against this dreadful malady? Though its effects on the disease occasioned by the tarantula, may have been greatly exaggerated, yet, if what

has been confidently asserted of its efficacy against the envenomed bite of the most dangerous serpents, be true, the analogy would afford, at least, a presumptive argument in its favour. But independent of this, other beneficial effects, in removing the wild ravings in certain fevers, might here be produced.

And it was considered by Clineas, Asclepiades, and Aretæus, as an essential remedy in phrenzy, melancholy, and mental derangement.

In the Memoirs of the Medical Society of Paris, vol. vi. is an affecting instance of a youth of twelve years old, who died of the hydrophobia. The distressing scene, near the close of the disease, induced the physician to try the effect of music, by playing before him on a guitar. The harmony, even at this late period, we are told, appeased the spasms, and rendered the pulse more calm and regular.

3dly. To support strength and restore the energy of the brain.

To enable the patient to bear up under the unequal conflict, his diet should consist of the most nutritious aliments, chiefly of the solid kind, to which may be added fresh eggs, jellies, and bread soaked in generous wine. If, from his dread of liquids, neither food nor medicine of the fluid kind can be got down, they must be conveyed in the form of medicated baths and enemas; of which the body, being in a parched absorbent state, will imbibe more than is generally imagined. Might not liquids also be safely conveyed into the stomach with a flexible tube, as in cases of suspended animation?

To restore oxygen to the blood, and invigorate the whole system, vital air, properly modified, may be inhaled into the lungs. Where this cannot be had, as nitrous acid contains it in a loose state and readily detached, the acid may be diluted with a portion of water, and administered as above mentioned.

Should any considerable truce to the violent symptoms be happily obtained, the return of paroxysm might possibly be obviated by a liberal use of Peruvian bark with steel, and by repeated oxygenation.

ARTIFICIAL ICE; FOR COOLING LIQUORS.

THE art of preserving snow, for cooling of liquors during the summer, in warm countries, was known in the earliest ages. This practice is mentioned by Solomon, and proofs of it are so numerous in the works of the Greeks and the Romans, that it is unnecessary to quote them. How the repositories for keeping it were constructed, we are not expressly told; but that the snow was preserved in pits or trenches, is asserted by many. When Alexander the Great besieged the city of Petra, he caused thirty trenches to be dug, and filled with snow, which was covered with oak branches, and which kept in that manner for a long time. Plutarch says, that a covering of chaff and coarse cloth is sufficient; and at present a like method is pursued in Portugal. Where the snow has been collected in a deep gulph, some glass or green sods, covered with dung from the sheep-pens, is thrown over it; and under these it is so well preserved, that the whole summer through it is sent the distance of sixty Spanish miles to Lisbon.

When the ancients therefore wished to have cooling liquors, they either drank the melted snow, or put some of it in their wine, or they placed jars filled with wine in the snow, and suffered it to cool there as long as they thought proper. It appears that in these

trenches it could not remain long clean ; on the contrary, it was generally so full of chaff, that the snow-water was somewhat coloured with it, and had a taste of it, and for this reason it was necessary to strain it.

That ice also was preserved for the like purpose, is probable from the testimony of various authors, but it appears not to have been used so much in warm countries as in the northern. Even at present, snow is employed in Italy, Spain, and Portugal ; but in Persia, ice. We have never any where found an account of Grecian or Roman ice-houses. By the writers on agriculture they are not mentioned.

Mankind however soon conceived the idea of cooling water without snow or ice, from having remarked that it became cold more speedily when it had been previously boiled, or at least warmed, and then put in a vessel among snow, or in a place much exposed to the air. Pliny seems to give this as an invention of Nero ; and a jocular expression in Suetonius makes it at any rate probable, that he was fond of water cooled by this method ; but it appears to be much older. It seems to have been known even to Hippocrates : at least Galen believes so. And Aristotle was undoubtedly acquainted with it ; for he says, that some were accustomed, when they wished water to become soon cold, to place it first in the sun and suffer it to grow warm. He relates also, that the fishermen near the Black Sea poured boiling water over the reeds which they used in fishing on the ice to cause them to freeze sooner. Galen on this subject is still more precise. He informs us that the above practice was not so much used in Italy and Greece, where snow could be procured, as in Egypt and other warm countries, where neither snow nor cool springs were to be found. The water after it had been boiled was put into earthen vessels or jars, and exposed in the evening on the upper part of the house to the night air. In the morning these vessels were put into the earth, (perhaps in a pit,) moistened on the outside with water, and then bound round with fresh or green plants, by which means the water could be preserved cool throughout the whole day. Athenæus, who gives a like account from a book of Protagorides, remarks, that the pitchers filled with water, which had become warm by standing all day long in the sun, were kept continually wet during the night, by servants destined to that office, and in the morning were bound round with straw. In the island Cimolus, water which had become warm in the day-time was put into earthen jars, and deposited in a cool-cellar, where it grew as cold as snow. It was generally believed therefore, that water which had been warmed or boiled, was soonest cooled, as well as acquired a greater degree of refrigeration ; and on this account boiled water is mentioned so often in the works of the ancients.

The same opinion prevails at present in southern countries of Asia, and people there still let their water boil before they expose it to the air to cool. The experiments however which have been made on this subject by philosophers, have proved very different in the result. When one indeed places boiling and cold water, all other circumstances being equal, in frosty air, the latter will become ice before the former has cooled ; but when one exposes to the cold, water that has been boiled, and unboiled water of equal degrees of heat, it may then be expected that the former will be converted into ice somewhat sooner.

Water

Water by being boiled loses a considerable portion of its air, while that of unboiled water must be disengaged before it can freeze, and by this its particles are kept in continual motion, which may retard its congelation. Boiled water however in cooling imbibes air again, but for that purpose seven or eight days are necessary, according to the observations of Mariotte. One might therefore conjecture that the Indians are right.

The experiments, however, made by Mariotte, Perrault, the Academy del Cimento, Marian, and others, shewed no perceptible difference in the time of freezing, between boiled and unboiled water; but the former produced ice harder and clearer: the latter ice more full of blisters. In later times, Dr. Black of Edinburgh has, from his experiments, asserted the contrary. Boiled water, he says, becomes ice sooner than unboiled, if the latter be left at perfect rest; but, if the latter be stirred sometimes with a chocolate-stick, it is converted into ice as soon as the former. This difference he explains in the following manner:—Some motion promotes congelation; this arises in the boiled water, through its re-imbibing air; and, therefore, it must necessarily freeze before the unboiled; provided the latter be kept at perfect rest. Fahrenheit had before remarked that water not moved would shew a cold some degrees below the freezing point, without becoming ice.

The time of congelation seems regulated by circumstances, with which philosophers are not yet sufficiently acquainted. A certain, but not every degree of stirring hastens it; so that every icy particle which is formed on the side of the vessel, or which falls from the atmosphere, may convert the water sufficiently cooled into ice instantaneously; and such unavoidable accidents must, where all other circumstances are equal, cause a great difference in the period of freezing. A variation, therefore, in the time, may be well expected; both because the boiling of the river-water expels the aerial acid; and because it produces also a kind of inspissation, and because by both these effects being produced the water must undergo some change.

The cooling of water, in ancient times, seems not to be ascribed so much to the boiling, as to the jars being kept continually wet, and to the air to which it was exposed. A false opinion seems also to have prevailed respecting the cause; and, because it was considered to be the boiling, many have not mentioned the real cause, which appeared to them only to afford a trifling assistance, though it has been remarked both by Galen and Athenæus. We know at present that the heat decreases by evaporation, or that coolness is produced. A thermometer kept wet in the open air, falls as long as evaporation continues. With æther of vitriol, and still better with that of nitre, which evaporates very rapidly, one can in this manner bring water even in the middle of summer to freeze; and Cavallo saw in summer a Fahrenheit's thermometer, which stood at 64° , fall in two minutes, by means of æther, to $+3$, that is to 29° below the freezing point.

On this principle depends the art of making artificial ice at Calcutta and other parts of India, between $25^{\circ} 30'$ and $23^{\circ} 30'$ of north latitude, where natural ice is never seen. Trenches two feet deep, dug in an open plain, are strewed over with dry straw; and in these are placed small shallow unglazed earthen pans, filled with water at sunset. The ice which is produced in them is carried away before sunrise next morning, and conveyed to an ice-cellar fifteen feet deep; where

where it is carefully covered with straw to be preserved from the external heat and air. A great deal, in this process, depends upon the state of the atmosphere. When calm, pure, and serene, it is most favourable to the congelation ; but when the winds are variable, or the weather heavy and cloudy, no ice is formed ; and the same is often the case when the nights are raw and cold.

It was once believed that this freezing was occasioned principally by the water having been boiled ; but it seems to be owing much rather to evaporation. It is not, however, said that the vessels are kept continually wet on the outside, but that they are unglazed, and so porous or little burnt, that the water oozes through them ; and on that account their exterior surface appears always moist. By vessels of this kind the trouble of wetting is saved. What has been said respecting the influence of the weather serves, in some measure, to confirm this conjecture. The more it favours evaporation, the ice is not only formed more easily, but it is better ; and, when evaporation is prevented by the wind or the weather, no ice is produced. The latest accounts how ice is made at Benares, say expressly that boiled water is not employed ; and that all those vessels, the pores of which are stopped by having been used, do not yield ice so soon or so good. In porcelain vessels none is produced ; and this is the case also when the straw is wet.

It appears that the practice of cooling liquors, at the tables of the great, was not usual in any country besides Italy and the neighbouring states, before the end of the sixteenth century. In the middle of that century there were no ice-cellars in France ; for when Belon relates, in the Account of his Travels, in 1553, how snow and ice were preserved at Constantinople throughout the whole summer, for the purpose of cooling sherbet, he assures us that the like method might be adopted by his countrymen ; because he had found ice-cellars in countries warmer than France. The word *glacière* also is not to be met with in the oldest dictionaries ; and it does not occur even in that of Monet, printed in 1635. Champier, the physician who attended Francis I. when he had a conference with the Emperor Charles V. and Pope Paul III. at Nice, saw the Spaniards and Italians put snow, which they caused to be brought from the neighbouring mountains, into their wine in order to cool it. That practice, which excited his astonishment, he declared to be unhealthful ; and this proves that, in his time, it had not been introduced at the French court.

Grand d'Aussy quotes an anecdote, related by Brantome, from which he forms the same conclusion. The dauphin, son of Francis I. being accustomed to drink a great deal of water at table, even when he was overheated, Donna Agnes Beatrix Pacheco, one of the ladies of the court, by way of precaution, sent to Portugal for earthen vessels, which would render the water-cooler and more healthful ; and from which all the water used at the court of Portugal was drunk. As these vessels are still used in Spain and Portugal, where the wine is cooled also with snow, both methods might have been followed in France. These Portuguese vessels are made of red bole ; are not glazed, though they are smooth, and have a faint gloss on the surface like the Etruscan vases. They are so little burnt, that one can easily break them with the teeth ; and the bits readily dissolve in the mouth. If water be poured into such vessels, it penetrates their substance ; so that, when in the least stirred, many air-bubbles are produced ;

produced; and it at length oozes entirely through them. The water that has stood in them acquires a taste which many consider as agreeable; and it is probable that it proceeds from the bark of the fir-tree, with which, as we read, they are burnt. When the vessels are new, they perform their service better; and they must then also have a more pleasant smell. If they really render water cold, or retain it cool, that effect is to be ascribed to the evaporation. Their similarity to those in which the Indians make ice is very apparent.

Towards the end of the sixteenth century, under the reign of Henry III. the use of snow must have been well known at the French court, though it appears that it was considered by the people as a mark of excessive and effeminate luxury. In the witty and severe satire on the voluptuous life of that sovereign and his favourites, known under the title of *l'Isle des Hermaphrodites*, a work highly worthy of notice, but which is exceedingly scarce, we find an order of the Hermaphrodites, that large quantities of ice and snow should, every where, be preserved, in order that people might cool their liquors with them, even though they might occasion extraordinary maladies, which, it seems, were then apprehended. In the description of an entertainment, we are told that snow and ice were placed upon the table before the king; and that he threw some of them into his wine; for the art of cooling it without weakening it was not then known. The same method was practised even during the whole first quarter of the seventeenth century.

Towards the end of the above century this luxury must have been very common in France. At that period there were a great many who dealt in snow and ice; and this was a free trade which every person might carry on. Government, however, which could never extort from the people money enough to supply the wants of an extravagant court, farmed out, towards the end of the century, a monopoly of these cooling wares. The farmers, therefore, raised the price from time to time; but the consumption and revenue decreased so much, that it was not thought worth while to continue the restriction; and the trade was again rendered free. The price immediately fell; and was never raised afterwards but by mild winters or hot summers.

The method of cooling liquors by placing them in water in which saltpetre has been dissolved, could not be known to the ancients, because they were unacquainted with that salt. They might, however, have produced the same coolness by other salts which they knew, and which would have had a better effect; but this they never attempted. The above property of saltpetre was first discovered in the first half of the sixteenth century; and it was not remarked till a long period afterwards, that it belongs to other salts also.

The Italians were the first people by whom it was employed; and about the year 1550, all the water, as well as the wine, drunk at the tables of the great and rich families at Rome, was cooled in this manner. Blaisius Villafranca, a Spaniard, who practised physic in that capital, and attended many of the nobility, published, in the before-mentioned year, an account of it, in which he asserts, more than once, that he was the first person who had made the discovery publicly known. In his opinion it was occasioned by the remark that salt-water in summer was always cooler than fresh-water. According to his directions, which are illustrated by a figure, the liquor must

must be put into a bottle or globular vessel with a long neck, that it may be held with more convenience; and this vessel must be immersed in another wide one filled with cold water. Saltpetre must then be thrown gradually into the water; and while it is dissolving the bottle must be driven round with a quick motion on its axis, in one direction. Villafranca thinks that the quantity of saltpetre should be equal to a fourth or fifth part of the water; and he assures us that, when again crystallised, it may be employed several times for the same use, though this, before that period, had by many been denied. Whether other salts would not produce the like effect the author did not think of trying; but he attempts to explain this of saltpetre from the principles of Aristotle; and he tells his noble patrons what rules they should observe for the preservation of their health, in regard to cooling liquors.

Towards the end of the sixteenth century this method of cooling liquors was well known, though no mention is made of it by Scappi, in his Book on Cookery. Marcus Antopius Zimara, however, speaks of it in his Problems. Levinus Lemnius also mentions the art of cooling wine by this method so much, that the teeth can scarcely endure it. We are informed by Bayle, that the earliest edition of his work, which has been often reprinted, was published at Antwerp, in the year 1559, in octavo. It contains only the two first books; but, as the above account occurs in the second book, it must be found in this edition.

Nicolaus Monardes, a Spanish physician, who died about the year 1578, mentions this use of saltpetre likewise. It was invented, as he says, by the galley-slaves; but he condemns it as prejudicial to health. From some expressions which he uses it appears that he was not sufficiently acquainted with it; and that he imagined that the salt itself was put into the liquor. At a later period we find some account of it in various books of receipts; such as that written by Mizaldus in 1566, and which was printed for the first time the year following.

In the Mineralogy of Aldrovandus, first printed in 1648, this process is described after Villafranca; but where the editor, Bartholomæus Ambrosianus, speaks of common salt, he relates that it was usual in countries where fresh-water was scarce to make deep pits in the earth; to throw rock-salt into them; and to place in them vessels filled with water, in order that it might be cooled. This remark proves that the latter salt was then employed for the same purpose; but it has led the editor into a very gross error. He thinks he can conclude from it, that the intention of potters, when they mix common salt with their clay, is not only to render the vessel more compact, but also to make it more cooling for liquors. But the former only is true. The addition of salt produces in clay, otherwise difficult to be melted, the faintest commencement of vitrification; a cohesion by which the vessel becomes so solid that it can contain fluids, even when unglazed; but for this very reason it would be most improper for cooling, which is promoted by the evaporation of the water that oozes through.

The Jesuit Cabeus, who wrote a voluminous commentary on the Meteorologica of Aristotle, which was ready for the press in the year 1644, assures us, that with thirty-five pounds of saltpetre one can not only cool a hundred pounds of water, by quickly stirring it, but convert it also into solid ice; and for the truth of this assertion he refers

to an experiment which he made. Bartholin says, that for the above account he can give him full credit; but the truth of it is denied by Duhamel, who suspects that this Jesuit took the shooting crystals of the salt to be ice. This seems very probable; for no one, in latter times, has succeeded to congeal water by saltpetre alone, without the help of snow or ice. The powder which a duke of Mantua had, in the middle of the last century, and by which, as the story goes, water, even in summer, could be instantaneously converted into ice, may, without doubt, have been only saltpetre.—Was this salt, therefore, considered formerly as the cause of the cold in the north-eastern and other countries, because it was used for cooling liquors? Even at present many farmers will say that such or such a field is cold, because it abounds with saltpetre.

Who first conceived the idea of mixing snow or ice with saltpetre and other salts, which increases the cold so much, that a vessel filled with water, placed in that mixture, is congealed into a solid mass of ice that may be used on the table, we cannot with certainty determine. Latinus Tancredus, a physician and professor at Naples, whose book *De fame et siti* was published in 1607, speaks of this experiment; and assures us that the cold was so much strengthened by saltpetre, that a glass filled with water, when quickly moved in the above mixture, became solid ice.

In the year 1626, the well-known commentary on the works of Avicenna, by Sanctorius, was published at Venice, in folio. The author in this work relates, that, in the presence of many spectators, he had converted wine into ice, not by a mixture of snow and saltpetre, but of snow and common salt. When the salt was equal to a third part of the snow, the cold was three times as strong as when snow was used alone.

Lord Bacon, who died in 1626, says that a new method had been found out of bringing snow and ice to such a degree of cold, by means of saltpetre, as to make water freeze. This, he tells us, can be done also with common salt; by which it is probable he meant unpurified rock-salt; and he adds, that in warm countries, where snow was not to be found, people made ice with saltpetre alone; but that he himself had never tried the experiment. Mr. Boyle, who died in 1691, made experiments with various kinds of salt; and he describes how, by means of salt, a piece of ice may be frozen to another solid body. Descartes says, that in his time this was a well-known phenomenon, but highly worthy of attention.

Since that period the art of making ice has been spoken of in the writings of all philosophers where they treated on heat and cold, and with many other experiments has been introduced into various books of receipts. It was then employed merely for amusement; and no one suspected that it would ever be applied to an important purpose in luxury. In the like manner Fugger's first bills of exchange were said to be useful only for gambling; and gun-powder was called a trifling discovery for idle amusement!

In the beginning of the last century drinking-cups made of ice and iced fruits were first brought to the table; but, towards the end of that century, it appears that the French began to congeal, in this manner, all kinds of well-tasted juices, which were served up as refreshments at the tables of the great and wealthy. This was a grand invention for the art of cookery; which became common among

professed cooks, both male and female, about the middle of the present century; and since that time our confectioners sell single glasses of iced articles to the ladies at our balls, and in the theatres.

Arfidas describes in the middle of summer, at the table of Juba, fresh apples, one-half of which were encrusted with transparent ice. A bason, made also of ice and filled with wine, was handed to him; and he was informed that to prepare all these things in summer was a new art. Snow was preserved the whole year through in pits lined with straw. Two cups made of copper were placed the one within the other, so as to leave a small space between them, which was filled with water; the cups were then put into a pail, amidst a mixture of snow and unpurified salt coarsely pounded, and the water, in three hours, was converted into a cup of solid ice, as well formed as if it had come from the hands of a pewterer. In the like manner apples just pulled from the tree were covered with a coat of ice.

After brandy, from being a medicine, came into general use as a liquor at table, and was drunk in common by the populace, the Italians, above all, endeavoured to render it weaker and more pleasant by various mixtures; and by raising its value to make it more respectable, and, at the same time, more useful to people of the first rank. That their wares might be distinguished, with more certainty, they gave them the name of *liquori*; and under that appellation sold them to foreign nations. The French were the first who adopted the use of these articles; particularly after the marriage of Hen. II. when duke of Orleans, with Catherine de Medicis, in the year 1533. This event brought to France great numbers of Italians, who made the French acquainted with these delicacies of their native country; and who taught them to prepare and to use them. They were the first, therefore, who made and sold the fine *liqueurs* at Paris; and in order to serve those who could not bear heating liquors, or rather to serve themselves by filling their pockets with money, their successors in this business invented, about the year 1630 or 1633, that beverage called *lemonade*, because the juice of lemons or oranges was its chief component part. This liquor soon came into high repute, as it not only served for cooling and refreshing people during the sultry heats of summer, but was even recommended by physicians against putrid diseases.

The *limonadiers*, or venders of lemonade, endeavoured to increase the first property, which occasioned the far greatest consumption, by the means of ice; and one of them, Procope Couteaux, an Italian from Florence, about the year 1660, conceived the happy idea of converting such beverage entirely into ice, by a process which had been before employed only by jugglers. The ready sale which he found for his invention induced others to make articles of the like kind. His example, therefore, was followed by Le Feyre and Foi; and those three, for some years, enjoyed a monopoly of this new-fashioned commodity. About the year 1676, liquors cooled by, or changed into, ice, must, however, have been the principal things sold by the *limonadiers*; for, being then formed into a company, the following delicacies were mentioned in the patent which they received on that occasion: *Eaux de gelée et glaces de fruits et de fleurs, d'anis et de canelle, franchipanne, d'aigre de cotre, du sorbec, &c.* There were at that time in Paris two hundred and fifty masters in this employ-

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ment. In 1699, when De la Quintiny wrote, iced liquors were extremely common.

People, however, long imagined that such articles could be used only during the hot months of summer. In the year 1750, Dubuiffon, successor to the celebrated Procope, *au café de la rue des Fossés de S. Germain des Près*, and author the *Art du distillateur*, began to keep ready prepared, daily, the whole year through, ices of every kind for the use of those who were fond of them. At first, they were little called for, except in the dog-days; but some physicians recommended them in certain disorders. Have the physicians then, by their opinion, done most service to the venders of *liqueurs* and to cooks, or the latter to the physicians? This would make a fine subject for an inaugural dissertation.—It is, however, certain, for we are told so by Dubuiffon himself, that after two cures, in which ices had been of the greatest service, the more discerning part of the public made use of them in every season of the year; and from hence the fashion has become universal.

FOREIGN LITERATURE FOR MARCH, 1800.

GERMANY has lately abounded with romance-writers. We shall only speak of a few who excel in invention and beauty of style. Haller and Wieland are well known. Göthe, whose happy choice of expressions, and nice discrimination of character, as his "Sorrows of Werter," and other works of the same kind, so abundantly attest, has the art of addressing his reader with the most captivating effect, and may justly be ranked as the first of German novel-writers. As a poet, he has claim to the highest praise, and in every point of view may be considered as one of the principal ornaments of German literature, and a writer who has eminently contributed to improve the taste and language of his country.

Knigge, well known for a work in the manner of Lord Chesterfield's Letters to his Son, abounding with fine rules of conduct, and inculcating morality very different from that which his lordship teaches, has likewise written a good novel, entitled, "The Romance of his Life," strikingly characteristic of the manners of some of the little courts among the three hundred great and small, that decorate the German empire.

No author approaches nearer to the elegance of the best French romance-writers, in the display of fine sensations, than Schultz. His "Moritz" is a master-piece of the kind. His Tours are written in a very correct style; and there is perhaps no tourist whose pictures of men and manners are delineated with a more delicate pencil than his.

Richer, known under the fictitious name of John Paul, is considered as the German Sterne. All his romances display original genius; but it were to be wished the author were less addicted to eccentricity and whim.

The romances of Muller abound in faithful pictures of the manners of Germany, and are written in an easy and agreeable style. Schummel and Wetzel likewise excel in correctness of diction and felicity of invention. With the two last Meissner may be joined, though the German critics do not allow him a very distinguished place

place among the classical writers; however, for happiness of invention, great praise is due to him.

Nicolai, a man of much erudition, has written several fine romances, which display great knowledge of human nature. His work on the state of the Belles-Lettres, and the various literary undertakings he has promoted, have highly contributed to assist the progress of literature in general: and for these services his country will ever remain his debtor.

La Fontaine, the author of many romances, which are the favourite reading of his countrymen, and, in most respects, deservedly so, is an ingenious, though sometimes diffusive, writer; a circumstance arising principally from the extreme fertility of his ideas. His works contain the purest morality, and are replete with fine remarks on human life in general.

Musaus, Fefzler, Heinse, and Thummel, have written romances, and each of them has his particular merit. The last is author of a fictitious tour through the south of France, which is interspersed with fine pieces of poetry.

Voss excels in most kinds of poetical composition, but chiefly in the descriptive. His *Louisa* is of the latter kind, and exhibits an enchanting picture of domestic happiness. As a translator of Greek and Roman poetry, his merit is transcendent. No nation can boast so good a version of the *Iliad* and *Odysssey*, as those produced by this favoured votary of the Muses.

Burger, the delight of Germany, possessed true poetic fire, and excelled chiefly in the tender and pathetic. His ballads and songs are in every one's mouth, and the beauty of them is felt by people of all nations.

Stolberg (whose interesting tour through Italy and the islands of Sicily has lately been ably translated into English) stands almost unrivalled as a lyric poet, in the list of German bards. His ballads are peculiarly sweet and tender; and his imitations of the Greek poets emulate their originals.

Matthiesson is a natural painter of rural scenes, a correct and elegant versifier, and a good poet.

The celebrated French astronomer, Lalande, is about to publish a "History of the Heavens," *Histoire Céleste*. The work is at the press, and in a state of considerable forwardness. He is also busied in preparing for the press a "*Bibliographie Astronomique*."

The Royal Academy of Medicine at Barcelona has proposed the following question: Whether cold baths are useful or prejudicial in disorders in the breast, and what their effects, according to circumstances?

Mr. Humbolt has made several experiments on the subject of the germination of seeds in the oxy-muriatic acid, and has found that this acid has a remarkable effect in accelerating the progress of vegetation. The seeds of garden cresses, when thrown into the fluid at the temperature of eighty-eight, shewed germs in three hours, while none were seen in water in twenty-six hours. Professor Pohl, at Dresden, produced in this manner vegetation from dried seeds in a collection of plants 120 years old; and Messrs. Jacquin and Vander Schott, at Vienna, have caused the growth of old seeds which in the botanical garden had resisted every other method.

Baron

Baron Racknitz is publishing a very splendid work at Leipzig, intended to exhibit the different styles of ornamenting the interior parts of edifices, in different countries, and in different ages. Each number, of which three have already appeared, contains six folio coloured plates of insides of buildings, and as many of appropriate furniture. With the letter-press of each, about 100 pages quarto, are twelve suitable vignettes. The price eight gold frederics, or 7l. sterling. The plates do honour to the baron's taste, and are executed in a superb style; and the dissertations accompanying them are of equal merit.

Mr. Vauquelin has made a new analysis of the red lead ore of Siberia, and asserts that it contains a new metallic acid, to which he gives the name of *chrome*, on account of its property of colouring every substance combined with it.

ORIGIN OF THE NIGHT-WATCH.

THE establishment of those people who are obliged to keep watch in the streets of cities during the night, belongs to the oldest regulations of police. Such watchmen are mentioned in the Song of Solomon, and they occur also in the book of Psalms. Athens, and other cities of Greece, had at least sentinels posted in various parts; and some of the *thesmothetæ* were obliged to visit them from time to time, in order to keep them to their duty. At Rome there were *triumviri nocturni, cohortes vigilum*, &c.

The object of all these institutions seems to have been rather the prevention of fires than the guarding against nocturnal alarms or danger; though in the course of time attention was paid to these also. When Augustus wished to strengthen the night-watch, for the purpose of suppressing nocturnal commotions, he used as a pretext the apprehension of fires only. The regulations respecting these watchmen, and the discipline to which they were subjected, were almost the same as those for night-sentinels in camps during the time of war; but it does not appear that the night-watchmen in cities were obliged to prove their presence and vigilance by singing, calling out, or by any other means. Signals were made by the patrols alone, with bells, when the watchmen wished to say any thing to each other. Singing by sentinels, in time of war, was customary, at least among some nations; but in all probability that practice was not common in the time of peace.

Calling out the hours seems to have been first practised after the erection of city gates, and to have taken its rise in Germany; though indeed it must be allowed that such a regulation would have been very useful in ancient Rome, where there were no clocks, and where people had nothing in their houses to announce the hours in the night-time. During the day, people could know the hours after water-clocks had been constructed at the public expence, and placed in open buildings erected in various parts of the city. The case seems to have been the same in Greece; and rich families kept particular servants, both male and female, whose business it was to announce to their masters and mistresses certain periods of the day, as pointed out by the city clocks. These servants consisted principally of boys and young girls, the latter being destined to attend on the ladies. It appears however, that in the course of time water-clocks were

were kept also in the palaces of the great: at any rate Trimalchio, the celebrated voluptuary, mentioned in Petronius, had one in his dining-room, and a servant stationed near it to proclaim the progress of the hours, that his master might know how much of his lifetime was spent; for he did not wish to lose a single moment without enjoying pleasure.

There were then no clocks which struck the hours, as has been already said; and, as water-clocks were both scarce and expensive, they could not be procured by labouring people, to whom it was of most importance to be acquainted with the progress of time. It would therefore have been an useful and necessary regulation to have caused the watchmen in the streets to proclaim the hours, which they could have known from the public water-clocks, by blowing a horn, or by calling out.

It appears however, that people must have been soon led to such an institution, because the above methods had been long practised in war. The periods for mounting guard were determined by water-clocks; at each watch a horn was blown, and every one could by this signal know the hour of the night; but we have met with no proof that these regulations were established in cities during the time of peace, though many modern writers have not hesitated to refer to the night-watch in cities what alludes only to nocturnal guards in the time of war. The bells borne by the night watchmen were used only by the patrols, as we are expressly told, or to give signals upon extraordinary occasions, such as that of a fire, or when any violence had been committed. Cicero, comparing the life of a civil with that of a military officer, says, "The former is awaked by the crowing of the cock, and the latter by the sound of the trumpet." The former therefore had no other means of knowing the hours of the night but by attending to the noise made by that animal. An ancient poet says, that the cock is the trumpeter which awakens people in the time of peace. The ancients indeed understood much better than the vulgar at present, who are already too much accustomed to clocks, how to determine the periods of the night by observing the stars; but people are not very fond of quitting their beds to look at the stars, which are not always to be seen.

It appears that night-watching was established at Paris, as at Rome, in the commencement of its monarchy. De la Mare quotes the ordinances on this subject of Clothaire II. in the year 595, of Charlemagne, and of the following periods. At first the citizens were obliged to keep watch in turns, under the command of a *miles guet*, who was called also *chevalier*. The French writers remark on this circumstance, that the term *guet*, which occurs in the oldest ordinances, was formed from the German words, *wache*, *wacht*, the guard, or watch; and in like manner several other ancient German military terms, such as *bivouac*, *landsguet*, &c. have been retained in the French language. In the course of time, when general tranquillity prevailed, a custom was gradually introduced of avoiding the duty of watching by paying a certain sum of money, until at length permanent *compagnies de guet* were established in Paris, Lyons, Orleans, and afterwards in other cities.

The establishment of single watchmen, who go through the streets and call out the hours, seems to have been peculiar to Germany, and was copied only in modern times by their neighbours. The antiquity
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of it however we will not venture to determine. At Berlin, the Elector John George appointed watchmen in the year 1588; but in 1677 there were none in that capital, and the city officers were obliged to call out the hours. Montagne, during his travels in 1580, thought the calling out of the night-watch in the German cities a very singular custom; "The watchmen," says he, "went about the houses in the night-time, not so much on account of thieves as on account of fires and other alarms. When the clocks struck, the one was obliged to call out aloud to the other, and to ask what it was o'clock, and then to wish him a good night." This circumstance he remarks also when speaking of Inspruck. Mabillon likewise, who made a literary tour through Germany, describes calling out the hours as a practice altogether peculiar to that country.

The horn of those watchmen seems to be the *buccina* of the ancients, which, as we know, was at first an ox's horn, though it was afterwards made of metal. Rattles, which are most proper for cities, as horns are for villages, seem to be of later invention. The common form, "Hear, my masters, and let me tell you," is very old. The Chancellor von Ludwig deduces it from the Romans, who, as he says, were more liberal with the word Master, like the French with Messieurs; but the Roman watchmen did not call out, nor yet do the French at present. It seems therefore that the city servants or beaules were the first persons appointed to call out the hours, as was the case at Berlin. These called out to their masters; which is still the usual appellation given to the magistrates in old cities, particularly in the Empire, and in Switzerland. At Gottingen the ancient form was only abolished in 1791, and the watchmen call out now, "The clock has struck ten, it is ten o'clock."

Watchmen who were stationed on steeples by day as well as by night, and who, every time the clock struck, were obliged to give a proof of their vigilance by blowing a horn, seem to have been established on a permanent footing, first in Germany, and perhaps before watchmen in the streets. In England, there are none of these watchmen; and in general they are very rare beyond the boundaries of Germany. That watchmen were posted on the tops of towers, in the earliest ages, to look out for the approach of an enemy, is well known, and has been sufficiently proved by Faber. In the times of feudal dissension, when one chief, if he called in any assistance, could often do a great deal of hurt to a large city, either by plundering and burning the suburbs and neighbouring villages, or by driving away the cattle of the citizens, and attacking single travellers, such precaution was more necessary than at present. The nobility therefore kept in their strong castles watchmen, stationed on towers; and this practice prevailed in other countries besides Ireland and Burgundy. It appears by the laws of Wales, that a watchman with a horn was kept in the king's palace. The German princes had in their castles, in the sixteenth century, tower-watchmen, who were obliged to blow a horn every morning and evening.

At first, the citizens themselves were obliged to keep watch in turns on the church-steeples, as well as at the town-gates; as may be seen in a police-ordinance of the city of Einbeck in the year 1573. It was the duty of these watchmen, especially where there were no town clocks, to announce certain periods, such as those of opening and shutting the city-gates. The idea of giving orders to these watchmen

watchmen to attend not only to danger from the enemy but from fire also, and, after the introduction of public clocks, to prove their vigilance by making a signal with their horn, must have naturally occurred; and the utility of this regulation was so important that watchmen on steeples were retained even when cities, by the prevalence of peace, had no occasion to be apprehensive of hostile incursions.

After this period persons were appointed for the particular purpose of watching; and small apartments were constructed for them in the steeples. At first they were allowed to have their wives with them; but this was sometimes prohibited, because a profanation of the church was apprehended. In most, if not in all, cities, the town-piper, or, as we say at present, town-musician, was appointed steeple-watchman; and lodgings were assigned to him in the steeple; but, in the course of time, as these were too high and too inconvenient, a house was given him near the church, and he was allowed to send one of his servants or domestics to keep watch in his stead. This is the case still at Gottingen. The city-musician was called formerly the *hausmann*, which name is still retained there, as well as at the Hartz, in Halle, and several other places; and the steeple in which he used to dwell and keep watch was called the *hausmann's thurm*. These establishments, however, were not general; and were not every where formed at a period equally early.

If we can credit an Arabian author, whose Travels were published by Renaudot, the Chinese were accustomed, so early as the ninth century, to have watchmen posted on towers, who announced the hours of the day as well as of the night, by striking or beating upon a suspended board. Marcus Paulus, who, in the thirteenth century, travelled through Tartary and China, confirms this account; at least in regard to a city which he calls Quinsai, though he says that signals were given only in cases of fire and disturbance. Such boards are used in China even at present; and in Petersburg the watchmen, who are stationed at single houses or in certain parts of the city, are accustomed to announce the hours by beating on a suspended plate of iron. Such boards are still used by the Christians in the Levant to assemble people to divine service, either because they dare not ring bells, or are unable to purchase them. The former is related by Tournefort of the inhabitants of the Grecian islands, and the latter by Chardin of the Mingrelians. The like means were employed in monasteries, at the earliest periods, to give notice of the hours of prayer, and to awaken the monks. Mahomet, who in his form of worship borrowed many things from the Christians of Syria and Arabia, adopted the same method of assembling the people to prayers; but, when he remarked that it appeared to his followers to favour too much of Christianity, he again introduced the practice of calling out.

The steeple-watchmen in Germany are often mentioned in the fourteenth and fifteenth century. In the year 1351, when the council of Erfurt renewed that police ordinance which was called the *suchtbrieff*, 'letter of discipline,' because it kept the people in proper subjection, it was ordered, besides other regulations in regard to fire, that two watchmen should be posted on every steeple. A watchman of this kind was appointed at Merseberg and Leisnig so early as the year 1400. In the beginning of the seventeenth century the town-piper of Leisnig lived still in apartments in the steeple.

In the year 1563, a church-steeple was erected in that place, and an apartment built in it for a permanent watchman, who was obliged to announce the hours every time the clock struck.

In the fifteenth century the city of Ulm kept permanent watchmen in many of the steeples. In the year 1452 a bell was suspended in the tower of the cathedral of Frankfort on the Mayn, which was to be rung in times of feudal alarm, and all the watchmen on the steeples were then to blow their horns and hoist their banners. In 1476, a room for the watchman was constructed in the steeple of the church of St. Nicholas. In 1509, watchmen were kept both on the watch-towers and steeples, who gave notice by firing a musket when strangers approached. The watchman on the tower of the cathedral immediately announced, by blowing a trumpet, whether the strangers were on foot or on horseback; and at the same time hung out a red flag towards the quarter in which he observed them advancing. The same watchman was obliged, likewise, to blow his horn on an alarm of fire; and that these people might be vigilant day and night, both in winter and, summer, the council supplied them with fur-cloaks, seven of which, in the above-mentioned year, were purchased for ten florins and a half.

In the year 1496, the large clock was put up in the steeple of Oettingen, and a person appointed to keep watch on it. In 1580, Montagne was much surprised to find on the steeple at Constance a man who kept watch there continually; and who, on no account, was permitted to come down from his station.

OF THE ORIGIN OF PHILOSOPHY.

MANKIND, in the first ages of society, before the establishment of law, order, and security, have little curiosity to find out those hidden chains of events which bind together the seemingly disjointed appearance of nature. A savage, whose subsistence is precarious, whose life is every day exposed to the rudest dangers, has no inclination to amuse himself with searching out what, when discovered, seems to serve no other purpose than to render the theatre of nature a more connected spectacle to his imagination. Many of these smaller incoherences, which in the course of things perplex philosophers, entirely escape his attention. Those more magnificent irregularities, whose grandeur he cannot overlook, call forth his amazement. Comets, eclipses, thunder, lightning, and other meteors, by their greatness, naturally overawe him, and he views them with a reverence that approaches to fear. His inexperience and uncertainty with regard to every thing about them, how they came, how they are to go, what went before, what is to come after them, exasperate his sentiment into terror and consternation. But our passions, as Father Malbranche observes, all justify themselves; that is, suggest to us opinions which justify them. As those appearances terrify him, therefore, he is disposed to believe every thing about them which can render them still more the objects of his terror. That they proceed from some intelligent, though invisible, causes, of whose vengeance and displeasure they are either the signs or the effects, is the notion of all others most capable of enhancing this passion, and is that, therefore, which he is most apt to entertain. To this too,

that cowardice and pusillanimity, so natural to man in his uncivilized state, still more disposes him; unprotected by the laws of society, exposed, defenceless, he feels his weakness upon all occasions; his strength and security upon none.

But all the irregularities of nature are not of this awful or terrible kind. Some of them are perfectly beautiful and agreeable. These, therefore, from the same impotence of the mind, would be beheld with love and complacency, and even with transports of gratitude; for whatever is the cause of pleasure naturally excites our gratitude. A child caresses the fruit that is agreeable to it, as it beats the stone that hurts it. The notions of a savage are not very different. The ancient Athenians, who solemnly punished the axe which had accidentally been the cause of the death of a man, erected altars and offered sacrifices to the rainbow. Sentiments not unlike these, may sometimes, upon such occasions, begin to be felt even in the breasts of the most civilized, but are presently checked by the reflection, that the things are not their proper objects. But a savage, whose notions are guided altogether by wild nature and passion, waits for no other proof that a thing is the proper object of any sentiment, than that it excites it. The reverence and gratitude, with which some of the appearances of nature inspire him, convince him that they are the proper objects of reverence and gratitude, and therefore proceed from some intelligent beings, who take pleasure in the expressions of those sentiments. With him, therefore, every object of nature, which by its beauty or greatness, its utility or hurtfulness, is considerable enough to attract his attention, and whose operations are not perfectly regular, is supposed to act by the direction of some invisible and designing power. The sea is spread out into a calm, or heaved into a storm, according to the good pleasure of Neptune. Does the earth pour forth an exuberant harvest? It is owing to the indulgence of Ceres. Does the vine yield a plentiful vintage? It flows from the bounty of Bacchus. Do either refuse their presents? It is ascribed to the displeasure of those offended deities. The tree, which now flourishes, and now decays, is inhabited by a Dryad, upon whose health or sickness its various appearances depend. The fountain, which sometimes flows in a copious and sometimes in a scanty stream, which appears sometimes clear and limpid, and at other times muddy and disturbed, is affected in all its changes by the Naiad who dwells within it. Hence the origin of Polytheism, and of that vulgar superstition which ascribes all the irregular events of nature to the favour or displeasure of intelligent though invisible beings, to gods, dæmons, witches, genii, fairies. For it may be observed, that in all polytheistic religions, among savages, as well as in the early ages of heathen antiquity, it is the irregular events of nature only that are ascribed to the agency and power of their gods. Fire burns, and water refreshes; heavy bodies descend, and lighter substances fly upwards, by the necessity of their own nature; nor was the invisible hand of Jupiter ever apprehended to be employed in those matters. But thunder and lightning, storms and sun-thine, those more irregular events, were ascribed to his favour, or his anger. Man, the only designing power with which they were acquainted, never acts but either to stop or to alter the course which natural events would take if left to themselves. Those other intelligent beings, whom they imagined, but knew not,
were

were naturally supposed to act in the same manner; not to employ themselves in supporting the ordinary course of things, which went on of its own accord, but to stop, to thwart, and to disturb, it. And thus, in the first ages of the world, the lowest and most pusillanimous superstition supplied the place of philosophy.

But when law has established order and security, and subsistence ceases to be precarious, the curiosity of mankind is increased, and their fears are diminished. The leisure which they then enjoy renders them more attentive to the appearances of nature, more observant of her smallest irregularities, and more desirous to know what is the chain which links them all together. That some such chain subsists betwixt all her seemingly disjointed phenomena, they are necessarily led to conceive; and that magnanimity, and cheerfulness, which all generous natures acquire who are bred in civilized societies, where they have so few occasions to feel their weakness, and so many to be conscious of their strength and security, renders them less disposed to employ, for this connecting chain, those invisible beings whom the fear and ignorance of their rude forefathers had engendered. Those of liberal fortunes, whose attention is not much occupied either with business or with pleasure, can fill up the void of their imagination, which is thus disengaged from the ordinary affairs of life, no other way than by attending to that train of events which passes around them. While the great objects of nature thus pass in review before them, many things occur in an order to which they have not been accustomed. Their imagination, which accompanies with ease and delight the regular progress of nature, is stopped and embarrassed by those seeming incoherences; they excite their wonder, and seem to require some chain of intermediate events, which, by connecting them with something that has gone before, may thus render the whole course of the universe consistent and of a piece. Wonder, therefore, and not any expectation of advantage from its discoveries, is the first principle which prompts mankind to the study of philosophy, of that science which pretends to lay open the concealed connections that unite the various appearances of nature; and they pursue this study for its own sake, as an original pleasure or good in itself, without regarding its tendency to procure them the means of many other pleasures.

Greece, and the Greek colonies in Sicily, Italy, and the Lesser Asia, were the first countries which, in these western parts of the world, arrived at a state of civilized society. It was in them, therefore, that the first philosophers, of whose doctrine we have any distinct account, appeared. Law and order seem indeed to have been established in the great monarchies of Asia and Egypt, long before they had any footing in Greece: yet, after all that has been said concerning the learning of the Chaldeans and Egyptians, whether there ever was in those nations any thing which deserved the name of science, or whether that despotism which is more destructive of security and leisure than anarchy itself, and which prevailed over all the East, prevented the growth of philosophy, is a question which, for want of monuments, cannot be determined with any degree of precision.

The Greek colonies having been settled amid nations either altogether barbarous, or altogether unwarlike, over whom, therefore, they soon acquired a very great authority, seem, upon that account,

to have arrived at a considerable degree of empire and opulence before any state in the parent country had surmounted that extreme poverty, which, by leaving no room for any evident distinction of ranks, is necessarily attended with the confusion and misrule which flows from a want of all regular subordination. The Greek islands being secure from the invasion of land armies, or from naval forces, which were in those days but little known, seem, upon that account too, to have got before the continent in all sorts of civility and improvement. The first philosophers, therefore, as well as the first poets, seem all to have been natives, either of their colonies, or of their islands. It was from thence that Homer, Archilochus, Stesichorus, Simonides, Sappho, Anacreon, derived their birth. Thales and Pythagoras, the founders of the two earliest sects of philosophy, arose, the one in an Asiatic colony, the other in an island; and neither of them established his school in the mother country.

What was the particular system of either of those two philosophers, or whether their doctrine was so methodized as to deserve the name of a system, the imperfection, as well as the uncertainty, of all the traditions that have come down to us concerning them, make it impossible to determine. It was in the school of Socrates, however, from Plato and Aristotle, that philosophy first received that form, which introduced her to the general acquaintance of the world.

DELETERIOUS EFFECTS OF CONFINED AIR.

THE following observations, on the effects of close hot rooms, from Dr. Rothergill's *Hints on Animation*, cannot but be interesting to those who pursue fashionable amusements, in crowded rooms, at the expence of their health.

The mathematical exactness with which the doors and windows of elegant houses are now contrived to shut, excludes the necessary ingress of fresh air. The diminutive size of the bedchambers is another capital error, and this is generally aggravated by the pernicious habit of sleeping with the curtains close drawn. The air thus confined, becomes replete with perspirable matter, exhaling from the lungs, and all the invisible ducts of the skin, and in this contaminated state is respired for several hours; a circumstance strangely overlooked in health, and but too much neglected in sickness. In putrid and contagious fevers, it renders the room not only very offensive, but highly dangerous to the patient, the practitioner, and the attendants.

In close crowded rooms deprived of ventilation, when the air becomes phlogisticated to a certain degree, the candles grow uncommonly dim, and we begin to feel a disagreeable sense of oppression, languor, and faintness, till fresh air is re-admitted, when these symptoms presently vanish; but should this be neglected till the air is completely contaminated, as in the dreadful scene of Calcutta, the same fatal catastrophe would naturally ensue.

Flame and all burning bodies contaminate air in the same manner as respiration. If a lighted taper is placed under a large glass receiver, its light gradually dwindles till, at length, it expires, rendering the air highly noxious.—This shews the absurdity of attempting to purify pestilential air by lighting up large fires; which, instead of correcting its contagious principles, serve but to injure its respirable qualities. Hence, also, appears the glaring impropriety of that profusion of
superfluous

superfluous fires and candles, which modern luxury has introduced into ball-rooms, assemblies, and all places of splendid entertainment; since these, by adding to the impurity of the air, already contaminated by respiration, cannot but prove very unfriendly to health. This, evidently, conspires with other circumstances in rendering the night air much less pure than that of the day. It may, therefore, serve to point out the pernicious tendency of that rage for late hours which so entirely possesses the polite world, and which begins to pervade even the inferior ranks of society. The votaries of fashion, in this country, seem to vie with each other in converting day into night, and night into day, by reversing all the sober rules of their wiser ancestors, and setting even nature at defiance.

A large portion of the time destined for repose is now spent in long vigils over the card table, or if it can be spared from game, it is devoted to midnight revels, or sometimes, perchance, to books and serious lucubrations. During this solemn period, the animal and even vegetable tribes yield to the powerful impulse of sleep. Plants, instead of breathing forth dephlogisticated air, now shed a baleful influence over the creation. While the external atmosphere is over-spread with nocturnal fogs and exhalations; the hot air of the room shares the unwholesome effluvia, now superadded to the other contaminating causes. The night being thus consumed in watching, the fragrant and refreshing hours of morning, intended for invigorating exercises, are spent in relaxing slumbers; and thus from day to day is the same unnatural retrograde course of life uniformly repeated, an inconsistency certainly unworthy the wisdom of superior orders of the community, and particularly those who preside over the common weal, and consider themselves as complete connoisseurs in the art of *savoir vivre*; not only statesmen and senators, but divines and philosophers, unite in thus deliberately yielding up their reason, and in becoming the willing slaves of this tyrannical custom. Above all, it is to be lamented that so unnatural a habit is so much countenanced by the British ladies; those arbiters of taste and elegance, who controul even custom, and from whose decision there is no appeal. Otherwise, I would beg to admonish the fair delinquents, that it is not only injurious to their health and vivacity, but also to their beauty and loveliness; for surely it is our duty to remind them, that whatever is subversive of the former, must ultimately prove destructive to the latter.

ACCOUNT OF DAR-FUR.—FROM BROWNE'S TRAVELS.

[*Mr. Browne is the first European who has been able to penetrate into the Empire of Dar-fur. The name of this place was first known in 1790, from Mr. Ledyard's Communications to the African Association. Mr. Browne's Journey may, therefore, be considered as a real and important Discovery.*]

BEFORE leaving Kahira, (Cairo,) says Mr. Browne, I was surprised that all commerce in Dar-tur was conducted by means of simple exchange. To carry on this in such a way as not to be grossly defrauded, especially having my attention engrossed by other objects, and in utter ignorance of the articles fit for bargain and sale in this country, seemed wholly impossible; I therefore sought for a person
who

who might go through this business for me, at least, with some share of probity. Such a one arose to the notice of my friends there; and knowing nothing more of the man, as indeed I could not know any thing more, than the character they gave of him, I took him on the general recommendation of being honest, and understanding the business in which he was likely to be employed. The person recommended had been a slave-broker in the market of Kahirá; a circumstance which, had it had been known to me earlier, would probably have prevented my employing him. Till the moment of departure, I observed in him keenness, but no fraud, and in general that submissive acquiescence and absolute devotion to the will of the superior, for which the lower class of Kahirines are externally; at least, remarkable. The hour for commencing our march, however, seemed, with him, the signal for disobedience and insulting behaviour; and we were not yet far removed from the confines of Egypt; when this misconduct was carried to such an excess, that I once levelled my gun at him, with a view of inspiring terror. The merchants around us interfered, and, for the time, this passed off; but the man only sought an opportunity of revenge, which the prejudices of the people of Soudan, in direct opposition to my former information, too soon afforded him means to gratify.

The letters with which I was provided for different merchants in this district, under whose roof I might have had a safe lodging, could be of no use to me till I had seen the sultan; for, till then, no person knew in what character to receive me. The object of this man, therefore, was to prevent my introduction to the sultan, and to preclude me from any opportunity of representing my case. We were no sooner arrived at Sweini, than he found means to employ one of his associates, who had been some years established in the place, to go to the monarch, and infuse into his mind suspicions of me as a Frank and an infidel, who came to his country for no good purpose, and whose designs it behoved him to guard against; and to suggest to him that it would not be proper I should remain at large, nor yet immediately come to his presence, but that some person should be commissioned to watch over and report my actions, and thus frustrate my supposed evil intentions. He added, as I afterwards found, many anecdotes, falsified or exaggerated, of the inquiries I had made, the way I had been employed, and my general behaviour on the road.

Nor was the villain himself idle during the time his coadjutor was thus laudably engaged. I have already mentioned, that there were no doors to the apartments of the house we were in. He took advantage of this circumstance, and my momentary absence, to take out of a box, which had been broken on the road, a quantity of red coral, the most valuable article in my package. As the box remained locked, it was not till long after that I discovered this loss. By the help of this commodity, he expected to make his way with the great. At the end of a few days this agent returned, bearing a specious letter, impressed with the sultan's seal; ordering that no officer on the road should presume to detain me, or take any thing from me, till I came to the house of Ibrahim el Wohaihi (the name of this very agent) in Cobbé, where I was to rest myself, till further orders should be given for my admission to his presence. I was not, indeed, at that time, privy to the plot; yet, if I could have obtained a knowledge of it, it might not have been easy, immediately, to counteract its influence; nevertheless,

nevertheless, I suspected something might have been practised against me. An order from the despot, which, while it was to protect me from his officers on the road, obliged me to confine myself to a particular spot, was a matter of surprise to me: but submission was unavoidable, as I was at that time unprovided even with the means of remonstrance. Had the machinations of my adversaries, which went much further than my confinement, having been actually employed against my life, been at that time known to me, this severity would not have caused any astonishment, and the means of redress might have been less doubtful. But suspense filled the void of positive suffering—a suspense to which no apparent remedy suggested itself. Those who had known me in Egypt, or on the road, were dispersed to the east and west, and the people of the place were ill disposed to form any communication with me, being filled with religious horror of one supposed an infidel, but of yet undefined impiety, and whose colour, variously regarded as the sign of disease, the mark of divine displeasure, or, at least, the unequivocal proof of inferiority of species, had averted their wonted hospitality, closed their compassion, and inflamed their personal pride and religious fury.

It was in this situation that, seeing no means of immediate relief, I began to feel impatience; which, as I continued in a state of perfect inactivity, communicated the more rapidly its pernicious influence to my state of health. On the fourteenth day after my arrival, I was attacked with a violent fever, attended with extreme pain in the head. How long it lasted I cannot precisely say, having, on the second day, lost my recollection. It was afterwards recalled by the effect of a dysentery, which lasted for two days, and left me too weak to assist myself. I had reflection enough to know, that, of the aliments there to be procured, scarcely any could be found that would not be pernicious. After the first attack, therefore, I confined myself to the use of bark and water, which last I drank in great quantities.

A little more than a month had elapsed, when, the symptoms appearing to diminish, I again pressed to be permitted to visit the residence of the sultan. But I had reason to regret my impatience; for, having, at length, obtained leave, I proceeded to El-Fasher, only to repeat my suffering. The rainy season was almost at an end, but the air, which still continued insalubrious, fatigue, and anxiety, renewed the malady, which, after extreme abstinence, and having gone through the short catalogue of remedies which I had had the precaution to take with me, I found unabated. Excessive headachs, lassitude, thirst, occasional constipation, succeeded by extreme irritation of the viscera, continued for several months to show the inefficacy of my precautions, and to incapacitate me from all personal exertion. At length, the heat of the ensuing summer gradually increasing, and producing regular and continued transpiration, and the state of the air, then meliorated, having removed the cause of indisposition, it was not long before I gained a certain degree of strength.

Arrived at El-Fasher, I was first introduced to the melek Misellim, one of the principal ministers. This man, when young, had been a slave, and engaged in domestic offices of the palace, but having been detected using some familiarities with one of the women, the monarch had ordered him to be deprived of the ensigns of manhood. Ignorant and uneducated, he appeared to have a certain quickness of apprehension, which, together with uncommon gaiety of humour, had rendered

rendered him acceptable at court, where he appeared more as a buffoon than a minister of state. He received me with a rude stare, as an object he was unused to, which was followed by a mingled smile of contempt and aversion. He was seated with some other of the royal attendants, under a kind of awning of cotton cloth, on a mat spread upon the sand. After the common salutations, the melek and his company entered into conversation on the nature of my visit to the country; and each made his remarks on my person, and offered his conjectures as to my character and intentions.

This conversation was partly carried on in their vernacular idiom, partly in Arabic. At length, a wooden bowl of polenta, and another of dried meat, were set before them. My illness deprived me of all inclination to eat; and observing the company not much inclined to invite me to join them, and yet embarrassed how to avoid that ceremony, I relieved them by declining it, and desiring them to begin. When they were satiated, and they lost no time in eating, a great number of foolish questions were asked me about Europe, some of which I waved, and satisfied them as to others in the best manner I was able.

One of the principal questions was, whether the English paid the *jizié* to the Ottoman emperor? This, as is well known, is a capitation tax, paid by the Greeks and others, for liberty to worship after their own manner. I replied, that England was so remote from the imperial dominions, that no war between the two countries could well have place, till all the rest of Europe should have submitted to the Mahometan arms, which had not hitherto come to pass; but that, for the purposes of trade, the inhabitants of the one country frequented the other, and by mutual agreement were considered as personally secure; that presents were occasionally made by the British king to the emperor, in token of amity, but not as a mark of subjection; and that the latter, on his part, as it did not appear that the decrees of the Almighty had fixed this as the moment of general conversion to the true faith, in virtue of his dispensing power, and swayed by the general law of hospitality to strangers, sanctioned by the authority of the prophet, judged it lawful, and even a matter of political expediency, to tolerate such Europeans as conducted themselves inoffensively in his dominions, though they did not pay the *jizié*. I thought it necessary to enter into this explanation of the terms on which I conceived myself to stand in relation to them, having by this time learned how rigidly they were disposed to adhere to the letter of the prophet's dictum, namely, that no infidels are to be spared but such as pay the capitation tax. When I observed they grew tired of asking questions, I seized the opportunity of explaining why I came there, and what favour I expected would be shewn me.

"Melek," said I, "having come from a far distant country to Misr (Kahira), I was there made acquainted with the magnificence, the extended empire, and, above all, the justice and hospitality, of King Abd-del-rachmân, whose dominion be eternal! Having been used to wander over various countries, as a derwish, to learn wisdom from the aged, and to collect remedies for diseases from the herbs that spring in various soils, I grew desirous of seeing Dar-fur. I was told that my person and property would be secure, and that permission would be given me to go wherever I might think proper. Since my arrival within the confines, I have found that all these assurances

Assurances were fallacious: my inclinations have been thwarted, my person treated with indignity, and my property plundered, while compliance has been refused even to my most reasonable demands. I ask redress.—What I have already suffered from the officers of the sultan is past, and cannot now be remedied, but I desire protection for the future. I desire the punishment of the man who has robbed me, and restitution of what has been taken. Nor is this all. I particularly desire permission to go to Sennaar, in order to proceed to Habbesh. I was prevented from going there, last year, by the straight road. Habbesh is a Christian country, abounding in slaves and gold. There are also many herbs valuable in medicine. Being there, I may easily join my countrymen, merchants who come to Moccha, in the Bahr Yemeni. I desire the sultan will allow me to proceed thither: and, if it be necessary, grant me his protection, and three or four persons, deserving confidence, to attend me to the frontiers of Kordofan. I have a small present to offer him, consisting of such things as my circumstances permitted me to bring. I hope he may not refuse to receive it, and to grant me the favour I ask." He answered, "Merchant, you are welcome to the Dar. The king is kind to strangers, and he will favour you in all you wish. Whatever you want you have only to demand. He has ordered a sack of wheat and four sheep to be sent you.—At this time it is not possible to pass through Kordofan. The sultan has a great army there; and when the country shall be in subjection to him you may pass unmolested. When you are admitted to his presence, you will tell him who has robbed you, and what you have lost, and he will cause it to be restored." It was now the hour of prayer, and when the company commenced their ablutions I retired.

During three or four days ensuing, I suffered so violent a relapse as to be unable to perform the common offices of life, and even to suppose that it was nearly at an end. The moment any symptom of amelioration appeared, I sent word to the melek that it was my wish to be introduced to the sultan, and then, as soon as possible, to be dismissed. No reply was made to this message: but the following day he came to the tent, with some of his attendants, and desired to see the merchandize that I had brought with me. As to part of the articles, consisting of wearing apparel suited to the great, &c. I very readily complied: but this was not sufficient.—The melek insisted also on seeing the contents of a small chest, which chiefly held articles useful to myself, but not designed for sale. There were also in it some English pistols, of which I intended to avail myself as presents at Sennaar, or wherever else I might be able to penetrate. I therefore positively refused to open the chest. He then threatened to have it broke open.—I remained unmoved.—At length, his attendants proceeding to break it open, Ali Hassad, the man who was with me, with his usual villany, took the key from its concealment, and opened the box. Every thing was taken out and examined minutely—many small articles appeared no more. The pistols were reserved to be taken by the sultan (after a violent but fruitless altercation) at the valuation made by his own servants: and my telescopes, books, of which they knew not the use, wearing apparel, &c. were graciously left me.

The valuation was to be made the following day, which was done quite against my consent, and in contempt of my warmest remon-

stances. Some part of the articles were stated at their full value, and others far below it. The whole was estimated at thirty-eight head of slaves, being at the market price worth about eighty, exclusively of a present of value for the sultan. A pair of double-barrelled pistols, silver-mounted, which cost twenty guineas in London, were valued at one slave, which is commonly purchaseable, by those who are experienced in that traffic, for the value of fifteen piastres in Egyptian commodities, (about 3l. 15s.) On this I exclaimed, that if they meant to plunder, and bargain and sale were not conducted in this country by consent of the parties, but by force, it would be better to take the whole gratis.—No answer was made, but the day following two camels were brought me as a present.

The violent manner in which my property had been seized, and the general ill treatment I had received, much augmented my disorder, already severe. I had now been fifteen days in the tent, exposed to great variations of temperature, it being at the close of the rainy season, and so entirely disregarded, that, though tormented with thirst, I could rarely obtain water to drink. I judged that the only means of restoration which remained were, to return to Cobbé, and avail myself of the shelter of a clay-house, and that privacy and quiet, the want of which I had so sensibly felt. Being in possession of the greater part of my property, and having left me only so much as would supply the wants of a few months, the melek did not seem very anxious about my stay. I hired two Arabs, and with the camels that had been given me, and the property that remained, made my way on the third day to the place whence I came.

In the intervals of my illness, I visited the chief persons of the place; and as the eyes of the people became habituated to me, I found my situation growing somewhat more tolerable. Idle, as I certainly was, during this winter, with respect to the immediate objects of my voyage, I grew of course more familiar with the manners and particular dialect of the country: for the Arabic, which is spoken here, differs materially from the vernacular idiom of Egypt. I seldom, indeed, joined in the parties where *merisi* (a fermented liquor) was introduced, because it was important not to hazard becoming concerned in the riots, which are the frequent consequence of their inebriation. But I was often diverted by the mode of conducting a bargain, which sometimes lasts for several hours; and I listened, perhaps not wholly without instruction, to their legal arguments, and the cool discussions of right, which are the consequence of often submitting disputes to arbitration. I could smile at the quibbling distinctions, by which the niceties of external observance are settled, but I had generally reason to be satisfied with their theory of morals.

It is usual for the graver men, during the heat of the day, to sit and converse under a shade erected for the purpose. When convalescent, I seldom failed to be of this party; for though the conversation contained few sallies of wit, much less profundity of observation, yet it was carried on without ill humour, with mutual forbearance, and on the whole in an equable course. Perhaps, indeed, the society appeared less dull, as dissipating reflections which my situation rendered unpleasant.

The following summer (1794), having in some degree recovered my strength, I determined to go and reside for a time near the sultan, as

well

well to have an opportunity of supplicating for redress of what I had already suffered, as to seize any moment that might offer of pressing my request for permission to advance. On leaving the house which I had inhabited at Cobbé, a dispute had arisen with the owner of it, who wanted me to sign a declaration that nothing had been lost during my residence in his house. This, which was directly the reverse of the truth, I refused to do: and in consequence he called an assembly of *fukhara*, or sacred judges. The result, after much contest, served to screen him from the responsibility legally attached to his conduct, without averting the charge, and determined me never to return to his roof.

On my arrival at El Fasher, my good friend the melek Misellim being employed by his master in the south, I went under the protection of the melek Ibrahim, one of the oldest persons in authority there, and lodged myself (as all strangers are obliged to lodge in the inclosure of some of the natives) in the house of a man named Musa, now only an inconsiderable officer, though one of the sons of Sultan Bekar. This Musa was one of the most upright and disinterested men I have known in that country, and indeed among the Mohammedans of any country. Calm and dignified in his demeanour, though poor and destitute of power, he never insulted, though his religion taught him to hate. No motive could have been strong enough to induce him to eat out of the same plate with a Caffre, but he was punctiliously observant of the rights of hospitality which that religion also dictated, and daily provided me with a portion of food from his kitchen. He often said, that, as it was a precept of my faith to hate the prophet, he was bound to encourage the same sentiment towards me; but that he was neither obliged to injure me, nor excused in doing so.

The melek Ibrahim is a man of about sixty years of age; tall, but not athletic, and characterised by the roughness rather than the expression of his features. He has no beard, and the little hair which remains either on his head or face is grey. His manners, and even the motions of his body, are ungraceful, and without the ease of superior rank, or the majesty of superior intellect. Yet his understanding seems clear and comprehensive, and his sagacity not unworthy the station assigned him—one of the first in the empire. He is indeed a bigot in matters of faith, but in all that concerns not the prevailing superstition, his judgment is cool, and little liable to error. He once held the reputation of integrity above the rest of his order, but his present riches render this character ambiguous. Generosity, however, holds no place among his virtues. The uniform tenor of his life is governed by mean avarice: and though the most opulent man in the empire, except the sultan, so little does he possess of Arabian hospitality, that the man used to be regarded as unhappy who went supperless to his evening councils. He had never yet seen a Frank, and regarded me nearly as the British or French commonly view the dwarf fish Goitres of the Alps. I could collect from his conversation that he looked on Europeans as a small tribe, cut off by the singularity of colour and features, and still more by their impiety, from the rest of mankind.

When I entered the court where he was sitting, he bade me welcome, and received with complacency a present which, in compliance with custom, I brought on the occasion. He even thanked me for

it; but expressed strong surprize at my journey to Dar-Fur. I complained of the injuries done me, and he assured me of redress for the past, and protection for the future. At the same time it was clear that he esteemed the present a tribute, and conceived that personal safety was more than I could reasonably expect. His conduct afterwards was a farther proof of his sentiments: for, though I remained at El-Fasher three entire months, I saw him only when I forced myself on his notice, and experienced no return of civility, much less any compensation for what I had already suffered.

During this time I was solicitous to attend regularly the levees of the sultan, which are from six in the morning till ten; but could very rarely obtain admittance, and when I did, had no opportunity of speaking. Whether the general prejudice against me, or the machinations of my enemies, produced this pointed disregard, which, as I said, a stranger scarcely ever experienced before, circumstances afforded no sufficient ground to decide. I suspected the former; but probably both had their share.

On returning to my temporary habitation, a shed, as was usual with me on the sun's approach to the meridian, fatigued with heat, oppressed with thirst, and not without inclination for food, my repast was commonly a kind of bread gently acid, moistened with water. I grew acquainted with a few of the people who attended the court, as well as with many strangers who were suitors there. Their conversation sometimes amused me, but more often I found their continued and unmeaning question harassing and importunate, and their remarks either absurd or offensive. The tedium of solitude, unfurnished with the means to render it agreeable, was however removed. I occasionally frequented the markets, which are usually held from four o'clock in the afternoon till sun-set. But, my person being there still strange, the crowd that assembled inclined me to a precipitate retreat.

The Furians here seemed unacquainted with the sports of the field. I occasionally went out with a gun after the commencement of the rainy season, when the face of the country became green: but little offered itself worthy of attention, either in the animal or vegetable kingdoms. During the early part of the summer, the earth had been parched, and destitute of all vegetation.

After waiting in fruitless expectation at El Fasher, as the time of my departure was drawing near, an accident happened, which, though not of the most pleasing kind, contributed to make me noticed, and obtained for me at length an interview with the sultan.—The slaves of the house used frequently to collect round me, as if to examine a strange object—I joked occasionally with them, without any other view than that of momentary relaxation. One day, as I was reading in the hut, one of them, a girl about fifteen, came to the door of it, when, from a whirl of the moment, I seized the cloth that was round her waist, which dropped, and left her naked. Chance so determined, that the owner of the slave passed at the moment, and saw her. The publicity of the place precluded any view of farther familiarity, but the tumult which succeeded appeared to mark the most heinous of crimes, and to threaten the most exemplary vengeance. The man threw his turban on the earth, and exclaimed—"Ye believers in the prophet, hear me! Ye faithful, avenge me!" with other similar expressions. "A Caffre has violated the property of a descendant of Mohammed," (meaning himself, which was utterly

erly false.) When a number of people was collected around him, he related the supposed injury he had received in the strongest terms, and exhorted them to take their arms and sacrifice the Caffre. He had charge a carbine, and affected to come forward to execute his threats, when some one of the company who had advanced farthest, and saw me, called out to the rest that I was armed, and prepared to resist.

It was then agreed among the assembly that some method of punishment might be found that promised more security and profit to the complainant, and would be more formidable to the guilty. The man whom I have already mentioned as my broker, was to take the slave, as if she had really been violated, and agreed to pay whatever her master should charge as the price. The latter had the modesty to ask ten head of slaves. He was then to make his demand on me for the value of ten slaves, and if I carried the matter before the cadi, which he supposed I should hardly venture to do, he had suborned witnesses to prove that I had received of him property to that amount.

On my removal from Cobbé to El-Fasher, I had caused my small remaining property, among which were few articles of value, but many of much use to me, to be lodged in the house of Hossein (the owner of the slave) and his companion. On my return thither, which happened within a few days after the accident, I claimed it: they resisted, as they alleged, at the suit of my broker, and would not deliver it till the value of ten slaves should be paid to him. I had from the first considered their conduct as so violent, that, if it reached the ears of the government, the claim must unquestionably be abandoned; and indeed my adversaries had only rested their expectations on the timidity which they had been accustomed to observe in Christians of the country, whose accusation and condemnation are in fact the same. I had not neglected to give the transaction all the notoriety I could, without having recourse to public authority, and those to whom I had applied were decidedly in my favour: I therefore now went to my adversaries, Hossein and his companion, and in their presence offered to Ali Hamad a promissory note for the value of ten slaves, at the market price on my arrival in Kahira. It was refused; and, my chest, in which were some German dollars and other articles, was still detained by them; the rest was given up.

In the mean time much had been said on the subject, both among the natives and foreigners; and the flagrant injustice I was likely to suffer forcibly struck all that were not in a state to profit by it, but none more than the Egyptian merchants: they were indignant to see that so enormous a penalty should be forfeited to those who had no claim but effrontery to demand it; and that they had no share, and were too numerous to expect to be all rewarded for connivance; accordingly some of them were diligent in carrying the news to the monarch.

I had indeed been told that the sultan was apprized of the transaction previously to my departure from El-Fasher, and that he intended to grant me redress; but after waiting about fifteen days, without hearing any thing farther of his intentions, weary of suffering, I determined to return. I had been there but a short time when a *fulganawy* (messenger) arrived express from the court, with orders for me to repair to El-Fasher immediately. The object of the

the message was kept in profound secrecy, nor could I discover whether it portended good or evil: I left Cobbé the same evening, and arrived at the end of my journey the following day, about noon.

I repaired, as before, to the melek Ibrahim, who, on the following day, introduced me at the public audience. The sultan, as he retired to the palace, after it was over, ordered all the parties to appear. Being come within the inner court, he stopped the white mule on which he was mounted, and began a short harangue, addressing himself to Houssein and Ali Hamad, my servant, in which he censured, in a rapid and energetic style, their conduct towards me. "One," said he, turning to Ali, "calls himself Wakil of the Frank; if he were a therif and a muslim, as he pretends, he would know that the law of the prophet permits not a muslim to be Wakil to a Caffre: an other calls himself his friend—but both are agreed in robbing him of his property, and usurping the authority of the laws. Henceforth I am his Wakil, and will protect him." He then ordered all the parties to repair to the house of Musa Wullad Jelfun, melek of the jelabs, under whose appropriate jurisdiction are all foreign merchants. Here it may not be improper to relate briefly how I had been before received by the sultan.

On my first audience I was too ill to make much observation: I was seated at a distance from him; the visit was short, and I had no opportunity of opening a conversation. He was placed on his seat (*cursh*) at the door of his tent. Some person had mentioned to him my watch, and a copy of Erpenius's Grammar, which I had with me. He asked to see both; but after casting his eyes on each he returned them. The present I had brought was shewn him, for which he thanked me, and rose to retire.

During the following summer, the first time I got admission to him, he was holding a diwan in the outer court. He was then mounted on a white mule, clothed with a scarlet *benish*, and had on his head a white turban; which however, together with part of his face, was covered with a thick muslin. On his feet were yellow boots, and the saddle on which he was seated was of crimson velvet, without any ornament of gold or silver. His sword, which was broad and straight, and adorned with a hilt of massy gold, was held horizontally in his right hand. A small canopy of muslin was supported over his head. Amid the noise and hurry of above a thousand persons who were there assembled, I was unable to make myself heard, which the nature of my situation obliged me to attempt, though not exactly conformable to the etiquette of the court, that, almost to the exclusion of strangers, had appropriated the diwan to the troops, the Arabs, and others connected with the government.

On another occasion, I contrived to gain admittance to the interior court by a bribe. The sultan was hearing a cause of a private nature, the proceedings on which were only in the Furian language. He was seated on a kind of chair, which was covered with a Turkey carpet, and wore a red silk turban; his face was then uncovered: the imperial sword was placed across the knees, and his hands were engaged with a chaplet of red coral. Being near him, I fixed my eyes on him, in order to have a perfect idea of his countenance, which, being short-sighted, and not thinking it very decent to use a glass in his presence, I had hitherto scarcely found an opportunity of acquiring. He seemed evidently discomposed at my having observed him

thus, and the moment the cause was at an end he retired very abruptly. Some persons to whom I afterwards remarked the circumstance seemed to think that his attendants had taught him to fear the magic of the Franks, to the operation of which their habit of taking likenesses is imagined by some of the Orientals to conduce. He is a man rather under the middle size, of a complexion a dusky or dry, with eyes full of fire, and features abounding in expression. His beard is short but full, and his countenance, though perfectly black, materially differing from the negro; though fifty or fifty-five years of age, he possesses much alertness and activity.

At another of my visits I found him in the interior court, standing, with a long staff tipped with silver in his right hand, on which he leaned, and the sword in his left. He then had chosen to adorn his head with the folds of a red silk turban, composed of the same material as the western Arabs use for a cincture. The melek Ibrahim presented him, in my name, with a small piece of silk and cotton, of the manufacture of Damascus. He returned answer, "*Balak ulla fi!*"—"May the blessing of God be on him!"—a phrase in general use, on receiving any favour; and instantly retired, without giving me time to urge the request of which I intended the offering should be the precursor. It is expected of all persons that, on coming to El-Father, they should bring with them a present of greater or less value, according to the nature of the business in hand. It is no less usual, before leaving the royal residence, to ask permission of the sultan for that purpose. With this latter form, which was to me unpleasant, I sometimes complied, but more frequently omitted it. But, on this occasion, having been long resident there, I thought fit to make a last effort to promote my design. The day preceding that which I had fixed for my return happened to be a great public audience. I found the monarch seated on his throne (*curfi*) under a lofty canopy, composed not of one material, but of various stuffs of Syrian and even of Indian fabric hung loosely on a light frame of wood, no two pieces of the same pattern. The place he sat in was spread with small Turkey carpets. The meleks were seated at some distance on the right and left, and behind them a line of guards, with caps, ornamented in front with a small piece of copper and a black ostrich-feather. Each bore a spear in his hand, and a target of the hide of the hippopotamus on the opposite arm. Their dress consisted only of a cotton shirt, of the manufacture of the country. Behind the throne were fourteen or fifteen eunuchs, clothed indeed splendidly in habiliments of cloth or silk, but clumsily adjusted, without any regard to size or colour. The space in front was filled with suitors and spectators, to the number of more than fifteen hundred.

A kind of an hired encomiast stood on the monarch's left hand, crying out, *à pleine gorge*, during the whole ceremony, "See the buffalo, the offspring of a buffalo, a bull of bulls, the elephant of superior strength, the powerful sultan Abd-el-rachman-el-rashid! May God prolong thy life!—O master—may God assist thee, and render thee victorious!"

From this audience, as from those which had preceded it, I was obliged to retire as I had come, without effecting my purpose. I was told there were occasions when the sultan wears a kind of crown, as common with other African monarchs; but of this practice I had no opportunity to bear testimony. When he appeared in public, a
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number of troops, armed with light spears, usually attended him, and several of the slaves were employed to bear a kind of umbrella over his head, which concealed his face from the multitude. When he passes, all the spectators are obliged to appear barefooted, and commonly to kneel—his subjects bow to the earth; but this compliance is not expected from foreigners. Even the meleks, when they approach the throne, creep on their hands and knees, which gave occasion to an Egyptian to remark, that the *Jarea* (a female slave) in Fur was a melek, and the melek a *Jarea*—alluding to the servile behaviour of the ministers, and the publicity of women in the domestic offices the palace.

The sultan Abd-el-rachman, soon after he became possessed of sovereign authority, with the ostensible motive of testifying his attachment to the religion of the prophet, but more perhaps with a view of obtaining greater weight among his subjects, by some mark of the consideration of the first of Mohammedan princes, thought proper to send a present to Constantinople: it consisted of three of the choicest eunuchs, and three of the most beautiful female slaves that could be procured. The Othman emperor, when they were presented, had, it is said, never heard of the Sultan of Dar-Fur, but he returned a highly ornamented sabre, a rich pelisse, and a ring set with a single diamond, of no inconsiderable value.

COMPARATIVE VIEW OF LIFE AND HAPPINESS IN THE EAST AND IN EUROPE.

THE great contrast which is observable between the manners and personal character of the Orientals and Europeans, insensibly leads to a comparison of its result in society. The character of every nation merits the attention of the philosopher; and the less that nation resembles ourselves, the more its distinguishing features require our investigation.

While vanity instigates us to claim an undisputed superiority, experience often compels to doubt the validity of the sentence on which we insist. We are fearful of being reduced to acknowledge, that the labour, the thought, the agitation, which have place among us, often augment not the happiness of the individual, and are of doubtful utility to the collective body. It is not however designed to insist on any such concession; and only a few considerations should be offered in the order they arise.

Impatience, activity, and sanguine hope, are the habits of an European. By education his imagination is exalted and his ideas multiplied. By reading, and frequent intercourse with foreigners, he is enabled to present to himself the state of distant times and remote nations. Their knowledge, their arts, their pleasures, become familiar to him; and, from a fixed principle of the human mind, the lively idea of all these advantages generates the hope of appropriating them. His first attempt is happily crowned with success, and he is thus stimulated to farther effort; but as the bounds fixed to his attainments are removed the farther he advances, and improvement is infinite, his ultimate disappointment is inevitable, and it is felt with a poignancy proportioned to the confidence of his first hopes.

The habits of the Oriental, on the contrary, are indolence, gravity, patience. His ideas are few in number; and his sentiments

in course equally rare. They are, however, generally correct, springing from the objects around him, and for the most part limited to those objects.

A chief cause of this contrast must be the mode of education in each community. Education should be the art of forming man on the principles of nature; by due attention to her unerring progress, no advantage of life can remain unimproved, and no duty can be misunderstood. But in no nation, with whose history we are acquainted, has such a system been established. Almost every one forms its disciples on the narrow views of that community, and nature is distorted and paralysed by authority.

The leading fault of education in the various parts of the Turkish empire, originates in the prevailing superstition. Wherever this does not operate, the practice is sufficiently rational.

The children of the Arabs early attain the character of manhood. A grave demeanour, fortitude in suffering, respect for age, filial affection, contempt for frivolous amusements, frugality, temperance, hospitality, are taught in the easiest and most effectual manner—by example; and, where there is least probability of counter-instruction, in the house of the father.

They are early taken out of the hands of women, and sent to study the Koran; an employment, which indeed has only the negative advantage of saving a portion of their time from positive idleness. As they advance towards maturity, little coercion is employed, but no incitement is administered to error. The father gradually accustoms himself to treat his son on the footing of an equal; who, on the other hand, seldom forgets the respect which is not imperiously exacted.

The dress of children is free from ligatures, their diet simple, and they are accustomed to variations of season, and enured to fatigue. These are a part of the advantages of Oriental education. Among its more serious inconveniences may be enumerated, an excessive credulity, the offspring of profound ignorance, and a keenness bordering on dishonesty, and falsehood. It is not easy to gain knowledge which is not sought. The boy respects his father, and the summit of his ambition is to imitate his sire. The parent is guided chiefly by the reflection, how far he may extend his pursuit of gain with impunity; of course a very refined morality is not to be expected from the son. Happiness once confined to the small circle of a family, little anxiety remains for the world at large. Hence the faintness of the conception of a community, and the duties arising from it.

In Europe, education is the art of moulding the soul to the times; and the preceptor is commonly successful in conveying the instruction, of which experience has taught him the advantage, and which he is no stranger to the mode of applying. Advancement is the object; and to obtain it activity is required. This end is gained; but in the art of directing the powers of his mind to the attainment of his own happiness, or to the public utility, or of preserving his body sane and vigorous, the man still remains a child; and thus the true object of education is frustrated. We have on this head then, it would seem, no great reason to boast our superiority.

The distinctive character of a nation is not to be sought in great cities. The manners of these reciprocally approximate. In that part of Egypt where the character of women is unsophisticated by mixture, however strong their passions, they are not unchaste. This perhaps proceeds

more from the influence of public opinion, than the sanctions of municipal law.

Among the people, as they are to take part in domestic duties, their education is bounded by the useful. Among the opulent it extends to the ornamental, and many females in Kaira are taught to read and write. Instead of complaining of their seclusion as an injury, they may sometimes be observed tenacious of it as a mark of respect. That seclusion, though originating in the real or supposed licentiousness of the sex, is, at this time, far from being the effect of individual jealousy, but by long adoption, becomes a part of *bien-séance*. "I consented to become your wife," said a woman to her husband, in my hearing, "that I might be veiled or private, *mafturé*, and remain tranquil in my family; not to be sent to the market, to meet the eyes of *chalkillah*, all the world."

The seclusion of women has an important effect in society; and the Orientals are accordingly, as has been often remarked, in a great degree strangers to the passion of *love*. It is thought indecent in company to speak much of women, and no man would venture to declare, that he had a preference for a particular woman, or intended to marry her.

Social intercourse is thus rendered less vivacious and amusing, but numberless inquietudes are avoided. They who affirm, however, that nothing is sought from women, among the people of the east, but sensual gratification, seem to err. Why should a man, by having several women, necessarily become insensible to what is amiable or estimable in any individual among them? Or is the individual character rendered absolutely indistinct by their being associated together?

They are equally in error who assert, that women in the east are slaves. Perhaps it might correctly be said that they are treated as children; but, supposing this to be true, do not tenderness and affection operate towards children?

They hold not the same rank as in Europe; and, if they did, the intrigues carried on in the harem would render their husbands and themselves miserable. In their present state accidents of this kind are not without ill effects, but, in general, serve rather to minister a cause of diversion, than to produce any very serious evil. Of course they give much less disturbance than in Europe.

The spirit of chivalry, fostered by the Crusades, changed, in the heated imagination of the youthful hero, the lovely object of his desires, into a deity that was to be adored. The visible nature of the divinity fanned the flame of devotion. Whether the fair benignly smiled, or scornfully averted her countenance from the humble votary, her perfections were equally the subject of his eulogies, and her will of his propitiation. But all his services were sublimely disinterested, and were to remain without hope of remuneration, till giants should be immolated to her perfections, and widows and orphans chaunt forth in her presence the praises of their generous deliverer.

These chaste amours, in which all was elevated, and all exquisitely unnatural, according to modern ideas, were yet the foundation of the rank women hold in modern Europe. This system, forced and contrary to nature, could not long have place, and perhaps the sex itself grew satiated with the frigid adulation of distant votaries, however flattering to its vanity. A more licentious gallantry then took place, and the charm was quickly dissolved. The intercourse between the sexes being at length reduced to the simple gratification of the sensual desire, society was almost
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in the same state in the west as in the east, at the period when the seclusion of females first took place.

But the Europeans adopted a different plan. They either despised the security of bolts and bars as ineffectual, or too much of their former respect yet remained to allow the attempt. The sex at length wearied, but not satiated with simple sensuality, was governed in the choice of its indulgences by caprice; and the men were studiously employed to attract the eyes of their mistresses, and to chain this fickle sentiment, by varied foppery and grimace. Hence the romantic tales of our novels, hence the inconsequential conduct of their heroes, and hence the agitation of our societies, at which the Orientals would smile.

It is not said, that the miseries and violent dissensions which exist in families, result from the rank females hold in European society. Eternal litigations, and all the confusion of severe laws and loose morals, are not attributed to that cause. It is only hinted that these evils are cœtaneous with that state of society, and that the pure institution of matrimony may be enforced by the commanding voice of religion, and sanctioned by municipal law, yet those evils may remain without a remedy.

The young of each sex are, in Europe, brought together, and taught to attach themselves to each other: but interdicted from uniting, unless equal in rank, fortune, &c. Passion, however, is strongest at an early age, when the reason which should guide it is weakest. But the public institutions eternize the punishment of a momentary folly. Parental authority, at other times, interferes, and, pretending only solicitude for the child's happiness, renders both the parent and the offspring miserable.

The husband is vain of exhibiting in public his admired bride. From familiarities with a variety of men which, by being public, are authorized, she is induced to try them in private. The man becomes unhappy and ridiculous, the wife disgraced, and the lover impoverished. Little or nothing of this is known in the east.

Another striking dissimilitude between the Europeans and Orientals is observable in the number and quality of their respective laws, and the administration of public justice. Though a multitude of commentaries has been written on the simple maxims contained in the Koran, applying them to the particular cases which occur in society, the whole falls far short, in point of extent, of the most simple systems of jurisprudence, with which we are acquainted. The single circumstance of each man being advocate in his own cause, contracts all judicial proceedings to a small compass, and, whether justly or unjustly, all legal disputes are speedily terminated. So that no man can bequeath to his family the inheritance of judicial ruin.

It will no doubt be thought, that the corrupt character of judges, and the sale of their decrees, are evils for which no advantages can compensate; and here, at least, it may be urged, that in Europe the administration of justice is more equal, and the right is not generally to be shaken with a bribe.

On the other hand, whatever may be the integrity of the judges in their decisions, the length and delay of the proceedings is sufficient to re-produce all the evils, which are thought to be obviated by the absence of judicial corruption. If one of the parties be poor, and the other rich, the latter commonly has the option of ruining the former by throwing impediments in the way of a decision; and it is of little importance

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importance to a man to know that he is ultimately victorious, when his property is already consumed, before the cause draw near its termination.

But independently of the immense expence of a process in most countries of Europe, the anxiety and suspense while it is depending, tend to lessen the happiness of society, and are, by their frequency, serious evils.

Domestic manners furnish a more minute but not unimportant contrast. In receiving strangers at his house, and when they leave it, the Oriental testifies no great emotion. The visitor is welcomed rather by actions than words. An Arab or Turk having once accorded protection, which he does with a kind of distance and hauteur, never afterwards withdraws it, and his word may be relied on. In visiting, as is well known, the common but absurd practice which obtains among ourselves, of urging those to stay longer, of whose company one is already tired, is obviated by the simple use of a little scented wood in a censer.

In their communications every thing tends rather to tranquillize the mind, than to excite the passions. The quarrels of the mere mob, indeed, evaporate in idle vociferation; but among persons of any breeding, the voice is scarcely ever raised above its ordinary tone.

The greatest number of menials in a family (and in the east they are very numerous) occasion no confusion. All is conducted in silence and order. All such directions as are in the common routine of affairs, are given by signs, and are instantly understood; not from pride, or as implying the vast distance between master and servant, but principally to avoid all *equivogue*, when persons of various descriptions are present, and, by making secrecy an uniform habit, to avoid all suspicion from the adoption of mystery in giving orders before company, when any thing is to be said which it is not intended that company should hear.

The ingenuity of man in contriving his own unhappiness, is in no part of the world more conspicuous than in Europe. Our mutual intercourse is so beset with forms, that it becomes doubtful whether it be a good or an evil; and the individual, not unfrequently, leaves a company dissatisfied that he ever entered into it. Hence a continued desire of changing place and forming new acquaintance.

Whenever a number of persons meet together, eating and drinking seem to be a necessary bond of union; and they often do not separate without that kind of festivity, which impairs the health of each, and creates dissensions, as it were, by its mechanical operations. The sole benefit which results from the social meals of the Arabs, is to us entirely unknown: no man thinks himself incapacitated from injuring his neighbour, in consequence of having divided with him a loaf of bread, and a little salt, at the convivial board.

In the east social intercourse is less artificial, and less hampered with rules. It is maintained with more complacency, and relinquished, not without hope of renewal. We too have now abandoned a part of its more inconvenient formalities; but some of its oppressive and despotic laws continue unaltered. The exterior may be changed; but the substance is identical.

In the east, they who are guilty of excess in drinking, bury their inebriation in the gloom of their closet. By this, present disturbance and future ill example are equally obviated, whatever may be the ill consequence to the wretched victim of intemperance. Of excess in eating there are few examples; for their longest meals, even when a
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series of dishes is presented, as at the tables of a pacha or a bey, are terminated in a few minutes. The moderation and temperance of diet indeed throughout the east, are matters of high praise; and whether virtues of climate, habit, or reflection, merit imitation among ourselves. The reward is present uninterrupted health and tranquillity of mind.

If the multitude of wants constitute human inquietude, it must be remembered how much of what to us is indispensable, is to them as if it had never been.

With them society is rendered tranquil and easy by mutual forbearance; with us it is vexed with the necessity of mutual adulation. In the one region each man sets a fashion to himself; in the other all the constituent parts are wearied with serving an idol, that the collective body alone has set up. Each stands bareheaded from respect to the other, when both might remain covered without inconvenience to either.

Politeness is with the one an easy compliance, with which all are satisfied: with the other, it is a difficult effort, from the practice and the experience of which the parties mutually retire discontented.

The fashions to which we are slaves, are indeed many of them so little founded in reason, that one is sometimes disposed to consider them as imagined, by the indolent and restless, to occupy the thoughts and time of those who have no better employment; or invented, like certain dogmas, to shew the merit of implicit credence. A certain dress is to be worn, a certain establishment kept up, under pain of indelible ignominy; and the man, whose circumstances disable him from complying with this terrific mandate, with timid irresolution hides his head.

See the European in conversation: even among his equals, he is not so solicitous to express such thoughts as rise in his mind, as to find some employment for his tongue. It is not to give utterance to what naturally occurs, but that conversation may be *kept up*, that all are anxious. Garrulities and misconceptions are civilly uttered for arguments; and the abortions of fancy and caprice hold the place of the same offspring of judgment and reflection. Yet we laugh at them for using short and few phrases (*phrases courtes et rares*, as Volney describes them) when they have nothing to say!

It is with them, however, neither ridiculous nor irksome to be silent. They go into company to be diverted, not to labour, and they esteem effort in conversation a vain toil. The raillery and repartee of the occidentals is, among them, supplied (it must be allowed very inadequately) by the *Meddahs*, story-tellers, and professed jokers.

Human life, in the east, is exposed to a variety of casualties. Pestilence, famine, tyranny, all conspire to diminish its security. It is natural to set a smaller value on any advantage, in proportion to the facility of privation. Hence the Orientals are not much disturbed at the thoughts of death, but resign life without a sigh. The mind is tortured when the blossoms of hope are suddenly torn from it; but their gradual decay is not incompatible with a kind of tranquillity.

The European, more dissatisfied with the present, and only supported by the hope of what is to come, attached beyond measure to the advantages which his anxieties have been prolonged to acquire, has already, even at an early age, fixed to himself a period, short of which he thinks *it hard and unjust* to be deprived of life.

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Concerning past events, the fatalist is consoled by reflecting, that nothing he could have done would have altered the immutable order of things, and that his efforts before would have been as vain as his regret now is. This idea, indeed, is perhaps not destitute of ill effects, but it surely produces some good. If, by persuading them that the evils which they suffer are unavoidable, it prevents them from endeavouring to avoid them; it also prevents their repining at what must, at all events, be endured as the immutable law of the universe.

The European, attributing more power to volition, ascribes to his own want of judgment or energy the result of whatever terminates unfavourably. Thus a part of his life is occupied by self-accusation, which however ensures no amelioration for the future.

In the east, if age be respected, it is respected, in part at least, from the decorous behaviour of the aged. In Europe, if it be rendered ridiculous, it is so too often by a vain effort to perpetuate the manners and character of youth.

The commanding influence of a system so flattering to the pride of its possessors, and operating so powerfully on their hopes and fears, as Mahomedism, aided by the dread of present suffering, has so far counteracted the strong impulse of avarice, that *gaming* is in a great degree banished from the east. All the evils and inconveniences therefore of that practice, so severely felt throughout Europe, are almost unknown in the Turkish empire.

If activity and a careful provision for the future, and that each should contribute his efforts to the good of the whole, be necessary to constitute the happiness of a people, how happens it that the Orientals, among whom these requisites are wanting, should yet be happy?

The system of morals contained in the writings of the Orientals, is at once sublime without being impracticable, and levelled to the use of mankind, without being loose or low. Yet it is usual with us to talk of their brutal stupidity! But this system is not practised among them—and is the Christian system of morals practised among Christian nations?

The Arabian and Persian histories and romances abound with traits of magnanimity, of generosity, justice, and courage, no way inferior to, but in some instances exceeding, those of other nations. The Greeks and ourselves have indeed stigmatised them with the name of barbarians; but impartial enquiry proves that they are susceptible of all that is admired in a polished people; that crimes are treated among them as among other nations, and that, though their passions may be expressed in a different way, they have always the same source and the same object.

No man who reflects on his past enjoyments and sufferings can doubt but that the latter, by their intenseness, duration, and frequency, have been decidedly predominant.

To render them more equal, that is, to be less miserable, or to make life tolerable, either the number of pleasures must be augmented, according to the system of the epicureans, or that of pains must be diminished, according to that of the stoics. The Orientals strive to attain the one object like ourselves, by sensuality; and here it is not to be conceived that they are happier than we are; but the other they gain in a much more complete degree than ourselves, and are much more exercised in the stoical system, which seems the most effectual to the purpose.

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The passions, indeed, it is said, are to the mind what motion is to the body; and the absence of either causes, and marks in each respectively, symptoms that may be termed morbid.

A perfect absence of passion is certainly preternatural, if it may not be called impossible; but, as our passions are more likely to be called into action by painful than by pleasurable sensations, it seems little doubtful, that the mind on which they operate most feebly, will remain in the most tranquil state. This tranquillity, this absence of pain, (for joy, however poignant, is but a transient gleam, a coruscation, which passing, renders the obscurity which succeeds it more sensible) is the single species of happiness of which mankind is allowed to partake.

A man of great sensibility has his feelings hourly wounded by minute accidents, at which one of less lively sensations would smile.

Such a one is transported with love, and, if that love be successful, his gratification is exquisite. He is suddenly moved by compassion,—how refined his feeling in offering relief to distress! He ardently desires fame—how he is elated with the slightest praises! But how often is his warm affection requited with neglect, or its gratification found impossible! How often will his compassion be excited, without the means of affording relief? And how much more is mankind disposed to obloquy than to eulogy?

But this is not all; the same mind which is strongly acted on by these passions, will also have its peace disturbed by pride, ambition, anger, jealousy, and resentment. The subjects of all these tormenting passions crowd on it too closely to allow its complacency to be permanent. The sunshine of the morning will inevitably, ere night, be succeeded by a tempest. Some slight omission of ceremonial will offend its pride, some sordid repulse will check its ambition; it will flame with anger at the breaking of a jar, or pine with jealousy at the like frailty in a mistress.

Something of the same kind has place with regard to taste. A man of delicate taste feels refined enjoyment from the contemplation of a beautiful landscape or a fine picture, or the perusal of an elegant poem: and is equally disgusted at the sight of any thing deformed, disproportioned, or unnatural, in either. But, it may be said, he has the option of contemplating a disagreeable object, but not of feeling an unpleasant sensation. And is it indeed so easy, in being perpetually conversant among mankind, to avoid observing their works? or does not the man who reads unavoidably fall on absurdities which disgust him? Social man has been too long employed in counteracting nature, not to have moulded all to his dwarfish intellect; and the abortive efforts of imagination are numberless both in the arts and letters.

Then it will be said, human happiness is reduced to apathy; and the lively taste and ardent passions, which have established the superiority of Europeans, only serve to diminish their sum of felicity! This would be pushing the argument too far; but each will draw his own conclusions.

The chief points of contrast between the Europeans and the Orientals being thus marked, it will be seen how far it may be doubted on which side lies the greater degree of happiness.

ACCOUNT OF THE SECT OF SAADI, OR SERPENT-EATERS.

[FROM SONNINI'S TRAVELS IN UPPER AND LOWER EGYPT.]

THE race of the Pfilli, a people who were persuaded that they possessed the power of setting serpents at defiance, of charming them, of making these reptiles follow them at their call, and of curing their bites, has been perpetuated in Egypt. There exists a sect called *Saadis*, from the name of their founder, a saint highly venerated among the Mahometans of that country. This Saadi had an uncle, a great man in Syria. Having one day sent him for some branches of the bushes in the desert, when the lad had cut the fagot, he was very much at a loss to tie it. After a fruitless search, he bethought himself of knotting together several serpents, and with this living cord he bound his fagot. The uncle, delighted with his nephew's acuteness, said to him: "Well, you may now make your way in the world, for you are more knowing than me." Immediately on this, the ingenious youth began travelling about the country, charming serpents by his wonderful and supernatural skill; and he had a great number of disciples, to whom he communicated his art. His tomb is near Damascus; it is filled with serpents and other venomous animals, among which a person may lie down and sleep, without their doing him the smallest injury.

Such is the superstitious origin of a very numerous sect in Egypt, each individual of which inherits the skill of its founder. Every year they celebrate his festival in a manner analogous to the institution. They march in procession through the streets, each holding in his hand a living serpent, which he bites, gnaws, and swallows piece-meal, making at the same time, frightful grimaces and contortions. But this festival, which I was desirous of seeing, was celebrated only in the summer; and I was extremely anxious to examine closely one of these serpent-eaters. On this occasion, M. Forneti and myself had recourse to the same means that we had employed respecting the circumcision (the mediation of a Turk;) and a Saadi came to my apartments, accompanied by a priest of his sect. The latter carried in his bosom a large serpent, which he was continually handling. After having recited a prayer, he delivered it to the Saadi. I observed that the reptile's teeth had been drawn; however, it was very lively, and of a dusky green and copper colour.

The Saadi, with a muscular hand, seized the serpent, which entwined itself round his naked arm. He began to be agitated; his countenance changed; his eyes rolled; he uttered terrible cries; bit the animal in the head, and tore off a piece, which we saw him chew and swallow. At that moment his agitation became convulsive; his howlings redoubled; his limbs writhed; his aspect bore the marks of madness; and his mouth, distended by horrid grimaces, was covered with foam. From time to time he devoured fresh pieces of the reptile. Three men in vain exerted themselves to hold him; he dragged them all three round the room, throwing his arms violently about on all sides, and striking every thing within his reach. To avoid him, M. Forneti and myself were sometimes obliged to cling to the wall, to let him pass and escape his blows. We could have wished the maniac far enough off. At length the priest took the serpent from him; but his fury and his convulsions were not at first appeased; he bit his hands, and his passion continued. The priest clasped him in his arms,
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put his hand gently upon his back, lifted him from the ground, and recited some prayers. His agitation gradually subsided, and he became completely exhausted, in which state he continued a few moments.

The Turks, who were present at the absurd and disgusting ceremony, were fully convinced of the reality of this religious frenzy. It is certainly true that, whether reality or imposture, it was impossible to express the transports of fury and madness in a more striking manner, or to see a man in a more terrific situation.

The great number of these serpent-eaters had induced some authors, and particularly Dr. Shaw, to believe that they subsisted entirely upon these reptiles. According to this English traveller, there are at Cairo and in its environs, more than four thousand persons who live on nothing but serpents. This, however, is a mistake; serpents are not a dish among the Saadis; and, if in their ceremonies they gnaw a few raw and alive, they are far from making them an article of food.

In Egypt these men are very much respected; but among the Turks of the other parts of the Ottoman empire they are only objects of laughter.

I had an opportunity of conversing with a sheick, or priest of this sect. He was of an open disposition; for, though he assured me that several of his fraternity had an extraordinary power over serpents, he confessed that he had not the smallest claim to it; but, on the contrary, was exceedingly afraid of these animals. By him I was informed of some particulars which I shall relate. In order to have serpents ready, upon every occasion, they keep them in their houses; but they previously take the precaution of extracting their teeth. If any person be bitten by a serpent, he runs directly to a Saadi, who mutters a few words over the wound, scarifies it with a razor; and, after having filled his mouth with lemon-juice, sucks the blood from it repeatedly. These men also cure the *serpent's breath*, an appellation given by them to inflammatory pustules which sometimes break out on those who sleep in the open air, with any part of the body uncovered, and which they pretend are caused by the poisonous breath of a serpent. The remedy they employ is oil of sesamum mixed with ceruse, or white lead. With this liniment they rub the pustules, never failing, at the same time, to mutter a few words, without which every remedy would be perfectly ineffectual. Such is the lot of mankind, that there is no nation in the universe, of whose history many pages are not appropriated to superstition!

CHARACTER OF THE LATE POPE, PIUS VI.

PIUS VI. was neither wicked nor weak; but he had several glaring defects, which could not escape the least discerning eye; and caprices which formed a striking contrast with the majestic gravity of the part he had to play. Nobody denied him several brilliant qualities, considerable capacity, an agreeable turn of mind, manners at once noble and prepossessing, an easy and florid style of elocution, as much information as could be expected in a priest imbued with the principles of his profession, and a taste for the arts tolerably correct. Impatient, irascible, obstinate, and susceptible of prejudices; he was, however, neither obstinately rancorous, nor premeditatedly malevolent. Few instances can be quoted of his sensibility; many may be adduced of his good-nature. In less difficult circumstances, and with means proportioned to his views, he would, perhaps, have passed for a prudent

sovereign. But his ruling passion was an excessive love of fame, which was the principal source of his faults and his misfortunes. It was that love of fame, which, when not joined to a strong mind, often degenerates into puerile vanity. He would have wished to signalize his pontificate in every manner; and to associate his name with the most splendid enterprizes. His vanity, which was apparent in every thing, drew upon him frequent mortifications. Descended from a family scarcely noble, he plumed himself, from the very beginning of his reign, upon his illustrious race. To the modest coat of arms of his ancestors, he added all the vain embellishments of blazonry; and composed an escutcheon which afforded ample room for ridicule. It is well known that the Italian people are more apt, perhaps, than any other, to lay hold of any thing ridiculous with merciless avidity. To two wings, of which the arms of his family consisted, he added an eagle *fleurs de lys*, and stars. These pompous armorial bearings were cruelly criticised in the following distich:

Redde aquilam imperio, Francorum lilia regi,
Sidera redde polo; cætera, Brasche, tua.

“Restore your eagle to the Empire; his lilies to the King of France; and the stars to heaven: the rest, Braschi, is your own.”

His arms and his name were repeated a thousand times over in Rome and in the rest of the ecclesiastical state. They are to be seen, not only upon the monuments which he erected, and upon such as he repaired, but even upon those in which he made the smallest change; and, unless Rome be utterly destroyed, the name of Pius Sextus, thanks to his provident vanity, will descend to the latest posterity. While changing the Roman government, the French commissaries expunged it from all the profane monuments; but it still exists upon all the sacred edifices in which Pius VI. had the most remote concern. It was calculated, in 1786, that this rage for availing himself of the slightest pretence for immortalizing his name had already cost the treasury two hundred thousand crowns. It was this incurable vanity, rather than his piety or taste for the arts, which suggested to him the idea of constructing a sacristy by the side of St. Peter's church. He there displayed a magnificence which may dazzle at first sight; but which cannot conceal its numerous defects from the eye of the connoisseur. Good taste may indeed apply to him the famous sentence pronounced by Apelles upon the Venus of a painter of his time: “You have made her fine, because you could not make her beautiful.” In like manner the sacristy of St. Peter's, which cost more than sixteen hundred thousand Roman crowns, is overloaded with all the most gaudy decorations which architecture, sculpture, gilding, and painting, can afford; but it only appears so much the meaner when compared with the superb edifice, by the side of which it stands. It is the design of Carlo Marchionni, an architect of inferior talents, and recalls to mind the defective school of Boromini; the style being altogether low and ignoble. Its dimensions are contrary to the rules of art; and it is full of nothing but breaks, niches, and projections. The columns and the altars are, in a manner, concealed in obscure corners; and the whole is surcharged with ornaments of the most tasteless kind.

In order to erect this monument to his glory, much rather than to that of the God whose vicar he called himself, it was necessary to pull down the temple of Venus, for which Michael Angelo had so much veneration, that he would have considered the mere idea of touching it as sacrilege.

It may be easily conceived that Pius VI. was not sparing of inscriptions in the sacristy of St. Peter's. Over the principal entrance were inscribed these words: *Quod at templi Vaticani ornamentum publica vota flagitabant, Pius VI. pontifex maximus, fecit perfecitque anno, &c.* "What the *public voice* demanded for the decoration of the church of the Vatican, Pius VI. sovereign pontiff, began and completed in the year, &c."

How great must have been his mortification, when under this inscription he found the following insolent lines:

Publica! mentiris. Non publica vota future,

Sed tumidi ingenii vota fuere tui.

"Thou liest! the public voice was not consulted; thou followedst the dictates of thy vanity alone."

That motive actuated him in all his enterprises: before his elevation to the pontificate, he had possessed the abbey of Subiaco, at the distance of twenty miles from Rome. There also he displayed, in the most expensive manner, his taste for magnificence. An abbey in which he had resided, a church in which he had celebrated the holy mysteries, could not be suffered to remain in obscurity. He spent considerable sums in embellishing Subiaco; and this is not one of the smallest reproaches that may be brought against his prodigality.

A protector of the arts, more out of ostentation than taste, he connected his name with the famous museum, which constituted one of the most beautiful and most useful ornaments of the Vatican; and the kind of glory, thence resulting to his pontificate, is not altogether usurped. That glory had tempted him when he was as yet only treasurer of the Apostolical Chamber. The famous statue of Apollo Belvedere was, in a manner, exiled, with several others, in one of the court-yards of the Vatican. Braschi suggested to Clement XIV. the idea of forming on that spot a collection of ancient monuments; and, as treasurer, presided over the first rudiments of this establishment. When seated upon the pontifical throne, he added body and confidence to his brilliant project. He built round the courtyard of the Apollo vast apartments, which he ornamented with statues, busts, terms, and bas-reliefs; and gave to the rich collection a title which associated his name with that of his predecessor. He called it the *Museum Pio-Clementinum*. That museum gradually became one of the most valuable in Europe; Pius VI. neglecting nothing to enrich it. He claimed the right of pre-emption whenever any antique was discovered; and, by thus eluding the greedy interference of the antiquaries, procuring monuments of art at the first hand, and at a moderate price. There it was that his vanity provided abundantly for its own gratification. Beneath each piece of sculpture which he had acquired, these words were engraved in letters of gold: *Munificentia Pii VI. P. M.* Most of these monuments of art stood in a bad light, and could not be seen to advantage without the assistance of a torch, the wavering gleams of which added to their beauty, by giving them life (if it may be so said;) the only thing in which some of them were defective. It was thus that connoisseurs went to admire the Ganymede, the Apollo Musagetes, the Torso, the Laocoon, and, above all, the famous Apollo Belvedere, which is alone worth a whole museum.

Engravings and explanations of the principal works of art thus collected, began to be published in 1783, under the auspices of Pius VI.

who was much flattered by the compliment. Lewis Myris undertook the task; and the learned Visconti, who in the first moment of the revolution, was elevated to the consulate of Rome, added to the plates a luminous commentary, which at once proves his taste, his sagacity, and his erudition. They were both, it must be confessed, powerfully seconded by the pope. The first six volumes of this work, in folio, had already appeared in 1792; and the seventh was ready when the political commotions in Italy began. All lovers of antiquity must regret the suspension of this undertaking; which does double honour to the pontificate of Pius VI.

Wherever there was any thing more splendid than useful to be done, the zeal of that pontiff, and particularly his name, were sure to appear. Wishing to embellish the entrance of the Quirinal palace, where he resided during the summer season, he raised, at great expence, in 1783, the obelisk which was lying upon the ground near the Scala Santa, and placed it between those two equestrian statues, that have given to the eminence on which the palace stands the name of Monte Cavallo.

Though the erection of this obelisk was in itself a thing little meritorious, adulation made it serve as a pretence for lavishing upon the holy father, in pompous inscriptions, the most ridiculously bombastic praise. But the Roman people, who were suffering a privation of the most necessary articles of life, while the treasury was exhausting itself in embellishing their city, did not partake of the enthusiasm felt by the authors of those inscriptions. A wag, who preferred food to obelisks, gave on this occasion a lesson to his holiness, by applying to him a well known passage of the gospel. He wrote these words at the bottom of the obelisk: *Signore, di a questa pietra che divenga pane*; "Lord, command that these stones be made bread."

Pius VI. took pattern from him whose vicar he was, and abstained from the miracle.

This rage for putting his name every where, and for suffering his munificence to be celebrated upon the most trifling occasions, exposed him to more than one sarcasm of a similar kind. It is well known that there was no other bread made at Rome but little round loaves, weighing a few ounces, which were called *pagnotte*, and which cost two *hatocchi*, or about two French sous apiece. The price never varied; but, according as corn was more or less dear, the size of the *pagnotta* was diminished or increased. At a moment of scarcity, when the administrators of provisions had been obliged to make an extraordinary reduction in the weight of the *pagnotta*, one of those innocent malcontents, who exhale all their gall in raillery, thought proper to put an exceedingly small *pagnotta* into the hand of Pasquin, and to write under the statue those pompous words, so often repeated in Rome, *Munificentia Pii Sexti*.

Bells had a double title to his predilection. They were connected with that worship, by the pomp of which he was so much flattered; and, the greater their size, the farther off did they announce the holy personage by whose orders they were set in motion. Malignity reproached him, in this particular, with more than one grave puerility. There was in St. Peter's church at Rome, a bell which only weighed 21,244lb. He ordered it to be recast in the year 1783, with the addition of 400 Quintals of metal. Three years afterwards he had another cast of 280 quintals, and christened it with great solemnity. Barbarous verses were afterwards engraved upon it, which attracted the admiration of the devout, and offended men of taste. It was loaded with valuable pearls,
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and decorated with eight dolphins, a crown, and a thousand other ornaments; but the founder's art had failed him; the bell had no sound. The wags made themselves merry at the expence of the bell, the founder, and the godfather. They voted that this abortion should be deposited either in the *Musæum Pio Clementinum*, or in the arsenal, after the example of the Abderitan sages, who were of an opinion somewhat similar in regard to a well, which was very skilfully constructed, and which wanted nothing but water.

But it was in the performance of his pontifical functions, above all, that his taste for ostentation was displayed, and that his vanity found frequent opportunities. It must be confessed, that on those occasions he was as much favoured by nature as by the pompous ceremonies of the Roman Catholic church. He was in all respects one of the handsomest men of his time. To a very lofty stature he joined a noble and expressive set of features, and a florid complexion, which the hand of time itself seemed to spare. He contrived to wear his pontifical habits in such a way, that they deprived him of none of his personal advantages. In every thing he did he displayed them with a refinement of coquetry which gave great scope to ridicule. When elevated to the papacy, he had, in conformity with a custom that had grown into a law, laid aside the peruke which he wore while cardinal. His forehead was entirely bald, but there remained behind, and on each side of his head, a ring of hair of the most brilliant white, which gave him a look at once noble and venerable. He had also one of the handsomest legs in Italy; and was not a little vain of it. Not wishing that his long pontifical robes should entirely conceal that part of his person to the adorning of which he was always scrupulously attentive, he took great care to hold them up on one side, so that one of his legs was entirely exposed to view. This affected display of his hair and legs, so unworthy of a grave pontiff, gave occasion to the following distich, which, though bad enough in itself, serves, however, as a proof that no opportunity was lost of turning him into ridicule: *Aspice, Roma, Pium. Pius! haud est: aspice mimum—luxuriante comâ, luxuriante pede.* "Rome, look at Pius. He Pius! no indeed: he is a comedian. Behold the display of his hair; and see how vain he is of his leg."

Nothing, indeed, was more striking than to see him, on days of great parade, crowned with the triple diadem, arrayed in robes of the most dazzling white, which contrasted with the splendour of the Roman purple, soaring in a manner over a crowd of ecclesiastics of every rank, and seeming thereby to announce his sway over the universal church. On these solemn occasions all the members of the clergy came and adored him repeatedly, and each class in a different way. The cardinals were not permitted to kiss his hand till they had bowed down before his throne. The prelates and heads of orders bowed still more humbly, and only rose as high as his knees, while the inferior clergy remained at his feet. The allegory of the statuary, prostrate before the work of his own hands, was never better applied, than to this stupid veneration, particularly of the cardinals for the sovereign pontiff—the creature of their intrigues and of their caprices; in which not one of them, perhaps, seriously thought that he saw the work of the Holy Ghost.

It is needless to say with what an eye of pity philosophy looks down upon this humiliating homage, paid by a multitude of reasonable beings to one of their fellow creatures. Many spectators, however, many even of those who were the most strongly guarded against all these vain illusions,

illusions, could not help feeling a strong emotion at the sight of the pomp that surrounded St. Peter's chair, especially while it was occupied by Pius VI. The greatest magnificence accompanied him whenever he went out. A carriage, at the back of which he was seated alone in an arm chair richly ornamented, moved forward, escorted by servants on horseback, and in long clothes, driven by a coachman and postilions with their heads uncovered, rolling along majestically flow between two rows of foot soldiers, and followed by detachments of light horse and cuirassiers. It was impossible for any thing to be more striking.

The jubilee of 1775, in all probability the last, was celebrated with a degree of magnificence, surpassing that of all the preceding ones. It was on this occasion that Pius VI. gave the first proof of his taste for pompous ceremonies. One of the principal circumstances of the festival, that indeed which may be called the first act of it, is the opening of the famous *porta santa*, or sacred door. This door, which is one of those of St. Peter's church, remained constantly shut, except during the holy year. It was then opened with a parade, of which Pius VI. took care not to diminish the effect. It was his office to preside over the demolition of a brick wall, that closed the entrance of the sacred door. Advancing with majestic gravity, he struck the first stroke, and instantly the wall fell to the ground under the redoubled blows of the workmen, to whom the signal had been given. The pious spectators eagerly seized upon the materials; each stone being an object of high veneration. By their contact with that which was laid four-and-twenty years before by the sacred hands of the sovereign pontiff, they had acquired the virtue of curing all sorts of diseases. According to custom, the *porta santa* remained open during all the holy year, and was the scene of the most ridiculous mummery. The pope himself did not pass through it without exhibiting marks of the most profound respect; while the pilgrims, disdaining the numerous passages which led into the church of St. Peter, entered it only by crawling under the sacred door upon their hands and knees. It was shut with great solemnity at the end of the year. The pope approached, sitting upon a kind of throne, and surrounded by the cardinals; and an anthem was sung, accompanied by loud music: it was the lyre of Amphiön about to rebuild the walls of Thebes. The pontiff then descended with a gold trowel in his hand; laid the first stone of the wall, which was to last twenty-five years, put a little mortar upon it, and reascended his throne. Real masons took his place, and completed the blocking up of the sacred door, the ceremony closing with a solemn mass. Thus did the Roman Catholics lavish the august mysteries of their religion, sometimes upon the baptism of a bell, and sometimes upon the rebuilding of a wall. The following day the festival was continued, Pius VI. displaying in it all his great talents for acting, which were hitherto but little known. He was already near sixty years of age; but his complexion still retained somewhat of the brilliant colouring of youth. The Romans, accustomed to see their pontiffs bending under the weight of years, and labouring in the performance of their public functions, which were often long and fatiguing, admired the address and grace with which the new pope acquitted himself of his task. The church seemed to grow young again, and to have a right, as well as Pius VI. to expect prosperous days.

It was shortly afterwards that the beauty of his person received an homage, to which the vicars of Jesus Christ were not accustomed. While Pius VI. was passing through a street of Rome, carried along with a splendour suitable to his dignity, a voice was heard from one of the windows,

dows, which were crouded with curious spectators. It was that of a young woman: *Quanto è bello! quanto è bello!* cried she in a moment of enthusiasm. An old woman, in haste to correct any thing that might appear too profane in this exclamation, replied, with her hands joined, and her eyes lifted up towards heaven, *Tanto è bello quanto è santo!* It is said, that such a compliment gave Pius VI. more secret satisfaction than all the incense lavished upon him by the prelates at the altar, and all the genufluxions of the sacred college.

As pope, he could not lead a more exemplary life; but as a man, and as a sovereign, he, no doubt, exposed himself to many and serious reproaches. An erroneous opinion had been formed of him in many respects. When rendered more conspicuous by his eminent station, he soon discovered a great ignorance of worldly affairs, particularly of politics; an obstinacy which never yielded to a direct attack; and an invincible attachment to certain prejudices, inseparable perhaps from his profession, but of which he neither suspected the inconvenience nor the danger. He entertained the most favourable idea of his own capacity. Rather headstrong than firm, he was constantly undoing what he had done; and this mixture of vanity and weakness was attended with two serious inconveniences. What was no more than inconsistency, and want of resolution, was taken for duplicity. Coldly affable, he never felt a real affection for any one; nor ever knew what it was completely to unbosom himself, unless when fear rendered him communicative.

Out of the five cardinals, who were successively his secretaries of state, there was not one who could flatter himself with having enjoyed his entire confidence. He granted it, but still under certain restrictions, to Gerdyl and Antonelli, two other cardinals; consulting them solely about matters in which he thought he could derive advantage from their talents.

Hasty, impetuous, and sometimes even passionate, he required to be curbed by fear, or soothed with affectionate language, which indicated an attachment to his interest, without hurting his pride. Cardinal de Bernis said of him, towards the end of the year 1777, "I watch over him incessantly, as over a child of an excellent disposition; but too full of spirits, and capable of throwing itself out of the window if left a moment alone."

That excellent disposition was afterwards in great measure spoiled by adulation, the possession of power, and the want of somebody bold enough to tell him the truth, or inclined to take the trouble. Faults gradually manifested themselves that the most clear-sighted had not even suspected. His long pontificate was, besides, a grievance which neither the cardinals nor the people of Rome could pardon him. In short, a concurrence of unlucky circumstances, to which he knew not how to accommodate himself, added to his improvidence and to his vanity, the principal source of his prodigality, and of his taste for brilliant but expensive enterprises, rendered him in the end more odious than many princes who have been really wicked. One of his operations alone will find favour with posterity, and even immortalize his name, although infected with that principal fault which manifested itself in every thing, and which was not one of the smallest causes of his sorrows: this is the draining, which he at least began, of the pontine marshes.

It remains for us to speak of the chief of that family, which, by a series of imprudent acts, suddenly fell from the pinnacle of greatness to the depths of the most deplorable humiliation. Pius, who by his own obstinacy

obstinacy and the evil counsels to which he had given ear, had prepared the way for the overthrow of the Roman government, remained almost entirely ignorant of the catastrophe which completed that event. He was yet overwhelmed with the consternation caused by the entry of the avengers of Duphot, when he learned that the cardinals had abdicated their temporal authority: he saw general Cervoni enter, who at this time held the chief command in Rome: he came to announce to the pontiff that the people had thought proper to resume their sovereignty. "And my dignity!" exclaimed his holiness in the accent of profound grief.—"It is too intimately connected with religion, which the people are determined to preserve inviolate. They have so expressed their resolution in the solemn act which has been proclaimed in their name; and they promise to make for you a provision suitable to your rank."—"And my person?" continued Pius.—"It is in perfect safety; and they engage to furnish a guard of a hundred and twenty men for its protection."—Pius was silent, and resumed an air of resignation.

But the hopes which this beginning had encouraged him to conceive were soon disappointed. Notwithstanding the wish so formally and solemnly announced by the people of Rome in favour of liberty, that capital harboured a considerable number of malcontents—of sincere fanatics, who considered the fall of the papal throne in no other light than as the downfall of religion—many hypocrites, who from motives of vanity and ambition were interested in supporting the ancient order of things. Under these circumstances the presence of the pope might give birth to conspiracies. Though he had, while vested with sovereignty, been viewed with the eyes of hatred, or at least of indifference, his misfortunes had now rendered him an object of sympathetic interest. The French commissioners thought it indispensable to the public safety that he should be removed from Rome, and even from the Ecclesiastical State. He was conducted to Tuscany, not at the request of the Grand Duke, but with his consent, which that prince would have been very glad to have the liberty of refusing. He was sensible that the presence of such a guest might become troublesome, and even dangerous. Pius was at first conducted to Sienna.

Here he lived in peace, and forgotten by almost every one except the devotees and some curious persons, when an earthquake shook the place which he had chosen for his retreat, and threw down several buildings. Pius lodged in the convent of St. Barbara; but, at the moment when the shock was felt, he happened to be walking in one of the public gardens of the city. He was hastily conveyed from within the walls of Sienna to a country house called by the name of *Hell*; which circumstance gave rise to the sarcasms of the undevout who had not felt compassion for his misfortune. After some time he was conducted to Florence. At the moment of his entering this city, the sky, which is usually so serene in Tuscany, was overcast with heavy clouds, and the rain fell in torrents. Malignity, which is so prompt, especially in Italy, to seize every opportunity of exercising itself, did not fail to observe that the pope brought bad weather with him wherever he came.

His first interview with the Grand Duke, which took place in presence of the Marquis Manfredini, was on both sides accompanied by marks of melting tenderness. The Grand Duke in particular was moved even to the shedding of tears: but he was not insensible of the inconvenience which might result to him from keeping the pope in his capital. In a few days after his arrival, Pius was conducted to a Carthusian monastery, at the distance of two miles from Florence. The

The fallen pontiff did not appear so deeply affected by his situation as might have been supposed: his health, far from being impaired by a catastrophe which would have caused any other person in like circumstances to die with grief, seemed to be in a more flourishing state. His relish for the pleasures of the table accompanied him to his solitude: and, on that subject, the following anecdote is related by credible witnesses:—On his arrival at the Carthusian convent, his holiness, who, among the small suite of servants by whom he was accompanied, had not forgotten his cook, gave him permission to take his station in the conventual kitchen, and there ordered him to prepare for his table delicate viands, which formed a striking contrast with the frugal fare of the monks. The latter, mortified no doubt by the comparison, pretended to be scandalized at the holy father's sensuality, and pronounced it to be the source of those calamities which desolated the church. The cook warmly defended the cause of his useful profession, and, in revenge for the ill humour shown by those recluses, slipped, unknown to them, a bit of meat into their pease-soup. This horrible plot being discovered, the monks utter shrieks of indignation, which reach the ears of his holiness. Pius fancies he still hears the revolutionary storm growl around him; he inquires what cause has excited it: to avoid the repetition of such a scene, he orders that his kitchen be henceforward separate from that of the monks; and they congratulate themselves on no longer having before their eyes the scandalous exhibition of the sovereign pontiff's epicurism.

Vanity, as another anecdote proves—and that particular species of it which was the least excusable in a pontiff and an old man—the vanity which is connected with external accomplishments, did not abandon Pius in his retreat. There lived at Florence a young Hungarian painter, who was desirous of the honour of drawing his holiness's portrait, with the intention, as he said, of presenting it to the empress. He was conducted to the holy father, who accepted his offer with a sort of enthusiasm: "Let your pencil," said he to the young artist, "revive that bloom and animated complexion which is somewhat faded through age and chagrin: paint me in scarlet robes, to give the greater relief to my features." The painter is said to have paid docile obedience to the directions of the pontiff's vanity; and Pius, even in the season of disgrace, still found a flatterer. It is asserted that his eyes dwelt with pleasure on that portrait, which some years before would have been a very good likeness, and which, by an innocent deception, carried him back to a less advanced age, and to happier days.

ON THE ART OF SCOURING DIFFERENT KINDS OF STUFFS.

THIS art supposes, 1st, A knowledge of the different substances capable of staining any kind of cloth; 2d, of the substances to which recourse must be had in order to make those deposited on the stuff to disappear; 3d, a knowledge of the effects produced on colours by those re-agents which it may be necessary to employ to destroy stains; 4th, a knowledge of the manner in which the cloth is affected by those re-agents; 5th, of the art of restoring a colour changed or faded.—Of those bodies which occasion spots on different kinds of cloth, some are easily distinguished by their appearance, such as greasy substances; but others have more complex effects, such as acids, alkalis, perspired matter, fruits, urine, &c. Acids redden black, fawn, violet,

violet, and puce-colour, and every shade communicated with orchilla-weed, iron, astringents, and every blue except indigo and Prussian blue. They render the yellows paler, except that of arnatto, which they change into orange.

Alkalies change to violet the reds produced by Brazil wood, logwood, and cochineal. They render the greens on woollen cloth yellowish, make yellow brownish, and change the yellow produced by arnatto to aurora. Perspired matter produces the same effects as alkalies.

When the spots are produced by simple bodies on stuffs, it is easy to remove them by the means already known. Greasy substances are removed by alkalies, soaps, the yolk of eggs, fat earths; oxyds of iron, by the nitric and oxalic acids; acids by alkalies, and reciprocally. Stains of fruit on white stuffs may be removed by the sulphurous acid, and still better by the oxygenated muriatic acid. But when the spots are of a complex kind, it will be necessary to employ several means in succession. Thus: to destroy the stain of coom from carriage-wheels, after the grease has been dissolved the oxyd of iron may be removed by the oxalic acid.

As colours are often changed by re-agents, it will be necessary, in order to restore them, that the scowerer should possess a thorough knowledge of the art of dying, and how to modify the means according to circumstances. This becomes the more difficult when it is necessary to re-produce a colour similar to that of the rest of the stuff, to apply that colour only in one place, and often to restore the mordant by which it was fixed, and which has been destroyed, or even the first tint which gave the colour its intensity. It may be readily conceived, that the means to be employed must depend on the nature of the colour and the ingredients by which it was produced; for it is known that the same colour may be obtained from very different bodies. Thus, after an alkali has been employed to destroy an acid spot on browns, violets, blues, poppies, &c. the yellow spot which remains may be made to disappear by a solution of tin; a solution of sulphat of iron restores the colour to brown stuffs which have been galled; acids restore to their former splendor yellows which have been rendered dusky or brown by alkalies; blacks produced by logwood become red by acids; alkalies change their red spots to yellow, and a little of the astringent principle makes them again become black. A solution of one part of indigo in four parts of sulphuric acid, diluted with a sufficient quantity of water, may be employed with success to revive the blue colour of cotton or wool which has been changed. Scarlet may be revived by means of cochineal and a solution of the muriat of tin, &c.

The choice of re-agents is not a matter of indifference. Vegetable acids are preferable; the sulphurous acid, however, may be employed for stains occasioned by fruit: it does not change the blue of silk, nor colours produced by astringents: it does not degrade the yellow of cotton. Ammonia succeeds better than fixed alkalies in removing spots produced by acids. It is employed in vapour; its action is speedy, and seldom alters the colour.

The means of removing greasy spots are well known. This effect is produced by alkalies, Fuller's earth, volatile oils dissolved in alcohol, a heat proper for volatilizing grease, &c. Spots occasioned by ink, rust, or iron-mould of any kind, and all those produced by the yellow oxyd of iron, are removed by the oxalic acid: the colour may be re-

stored

stored by alkalies, or a solution of the muriat of tin. These spots may be removed also by the oxygenated muriatic acid, when they are on white stuffs or paper.

The action of alkalies, and that of perspired matter, are the same: their spots may be effaced by acids, or even by a weak solution of the muriat of tin. When these spots arise from several unknown causes, in order to destroy them recourse must be had to *polychrest* compositions. The following may be considered as one of the most efficacious. Dissolve white soap in alcohol, and mix this solution with the yolks of from four to six eggs: add gradually essence of turpentine; and incorporate with the whole some Fuller's earth, in such a manner as to form balls of a suitable consistence. Moisten the spot; and, having rubbed it with these balls, the spot will be removed by washing the stuff. All spots, except iron-mould and ink, may be removed in this manner.

Washing destroys the lustre, and leaves a tarnished place disagreeable to the eye; but the lustre may be restored by drawing over the washed place, and in the direction of the pile, a brush moistened in water impregnated with a little gum. You may then apply a sheet of paper, or a piece of cloth, and a considerable weight, under which the cloth must be left dry.

NEW THEORY OF RESPIRATION.

PROFESSOR HERHOLDT read lately, before the Academy of Sciences at Copenhagen, a memoir respecting some experiments made by him and M. Rafn on living animals, in order to discover the mechanism of respiration; having in view, at the same time, the cure of wounds in the breast. The professor shewed that the best authors on surgery have hitherto explained the mechanism of respiration in a manner diametrically opposite to what it really is; so that, by applying their theory to the cure of wounds in the breast, they have followed a method altogether false. According to his experiments the lungs have not, as has been maintained, an expansive force peculiar to them, but the movement is performed by the action of the diaphragm, to which sufficient attention has not hitherto been paid. When there are wounds in the breast, the atmospheric air enters by them on inspiring into the cavities of the thorax, and issues on expiring. This has been proved by experiments made on horses, dogs, and cats.

MM. Herholdt and Rafn, in examining the manner in which the frog breathes, remarked, that this animal is without a diaphragm, and that its lungs at the same time have no expansive force; but that a small membrane, by means of which it can shut its mouth hermetically, discharges the function of the diaphragm; so that, when it is prevented from shutting its mouth by inserting into it a small rod, the animal dies in a few minutes, because it is no longer able to breathe. When it is suffered to shut its mouth before it is entirely dead, or when it is only in a state of asphyxia, it soon recovers. If a frog be deprived of this membrane, by cutting it entirely off, or only in part, so that its mouth can no longer be hermetically shut, it expires in a longer or shorter time according to the size of the aperture made: on the first view it appears very paradoxical that man, as well as the greater part of animals, loses his life by not being able to breathe when his mouth and nose are shut, and that the frog dies because it cannot breathe when its mouth is opened. The explanation of this phenomenon, however,

is easy when we recollect that the lungs have no expansive force. In consequence of this new theory, M. Herholdt has succeeded in curing very dangerous wounds made in the breasts of dogs.

The above experiments, which were communicated to the Philomatic Society at Paris, by M. Manthey, were repeated with success, by the commissioners of that society, on frogs and salamanders. If a gag be put into the mouth of one of these animals, so as to prevent it from shutting its mouth, it dies at the end of half an hour. The respiration is performed as follows :—The mouth being absolutely shut, the frog dilates its throat, and the air rushes in by the nostrils; it afterwards contracts its throat, and the air penetrates to the lungs, because, no doubt, there is a small valve in the nostrils which prevents it from escaping by the same way that it entered; for the membrane, which the Danish authors assert they observed in the mouth, could not be seen by the commissioners. Lizards and serpents, which have ribs, breathe like other animals; and a forced opening of the mouth does not kill them.

METHOD OF CHECKING DECAY IN TREES.

THE chestnut lives a long time, and often attains to an extraordinary size; but unfortunately the texture of its wood alters under certain circumstances: it becomes soft, falls into dust, a cavity is gradually formed in the heart of the tree, and this cavity, by the progress of the decomposition, becomes still larger; so that, at last, the trunk seems to consist of nothing but bark; and being too weak to support the branches, and resist the violence of hurricanes, it cannot long exist. It is by similar changes and decompositions of the ligneous principle, that trees, which have been growing for ages, are seen to perish in a very little time.

C. Chaptal, in travelling through different parts of France, and particularly the Cevennes and the department of Allier, observed, that a great number of chestnut-trees were hollow, and charred over the whole internal surface. He was told by the inhabitants of the country, that this process was employed to stop the progress of the caries, which otherwise would destroy the whole tree. When they observe that this disease, which is very common and exceedingly fatal to the chestnut-tree, begins to make any progress, and to excavate the trunk, they collect heath and other vegetables, and set fire to them in the cavity, till the whole surface is completely charred. It happens very rarely that the tree perishes by this operation, and it is always found that this remedy suspends the effect of the caries. It is practised with the same success on the white oak. By comparing the effects of the cautery on the human body, in analogous cases of degeneration, we perceive a new similarity between diseases which affect the living organized beings of the two kingdoms, and between the remedies by which they may be checked.

FREEZING OF THE NEVA; PALACE OF ICE.

THE covering of the Neva with ice, and the breaking up of it, are remarkable phenomena. When the ice is setting-in, as it is called, small detached flakes of ice are seen floating down the current, which soon grow into large fields, and acquire so great a momentum, that

that the bridges must be hastily taken asunder, to prevent their being carried away by the ice, a disaster which has happened more than once. These large plains of ice continue for a day or two passing with the current, while the boats are seen rowing between them; till all at once the floating ice stops, either by the gulf being already closed below, or the flakes of ice freezing together: when immediately foot passengers, who have been waiting on the shores for this happy moment, go over in all safety. Nothing is more common than to see boats crossing the river, and, in two hours afterwards, to behold hundreds of people going over on foot.

No less rapid is the departure of the ice. In the spring, the first indication of this approaching event is the standing of the snow-water on the ice; then the ice becomes more porous, or divides into spiculæ, lets the water through, and becomes of a blackish colour. At length it parts, while the roads that have been well trod during the winter still remain; so that often foot passengers are seen on these roads, and between them and the floating sheets of ice, boats in great numbers passing and repassing. By the force of the current, and shocks received from the floating ice, at length the roads give way; the ice continues to fall down with the stream for a day or two to the gulf, and the whole river is clear. A week or a fortnight after this, the ice of the Ladoga comes down; which, according as the wind may happen to be, continues a couple or more days, sometimes as many weeks, and renders the atmosphere uncommonly chill.

The ice and the cold are of service to the inhabitants in various ways. Distances are much shortened by their means, inasmuch as people, horses, and carriages of all sorts, and of ever so great burden, can cross the Neva, and the other rivers, lakes, and canals, in all places and directions; and the Cronstadt gulf supplies, in some measure, the want of navigation during the winter, by the transport of commodities of every denomination over the ice. As ice-cellars here are a necessary of life, for keeping provisions of all kinds during the summer, so every house in every quarter of the town is provided with one of them, to be filled with large blocks cut out of the river. This operation generally takes place about the beginning of February. The ice also promotes the pleasure of the inhabitants by giving them an opportunity for the diversion of sledge and horse-racing, and for that of the ice-hills, so much admired by the populace. The weight of these ice-hills, together with that of a multitude sometimes of 5000 or 6000 persons standing about them on holidays, give the spectator a surprising idea of the strength and solidity of the ice.

What may be executed in ice was shewn by the ice palace which the Empress Anne caused to be built on the bank of the Neva, in 1740. It was constructed of huge quadrats of ice hewn in the manner of free stone: the edifice was fifty-two feet in length, sixteen in breadth, and twenty in height. The walls were three feet thick. In the several apartments were tables, chairs, beds, and all kinds of household furniture, of ice. In front of the palace, besides pyramids and statues, stood six cannons carrying balls of six pounds weight, and two mortars, of ice. From one of the former, as a trial, an iron ball, with only a quarter of a pound of powder, was fired off. The ball went through a two-inch board, at sixty paces from the mouth of the cannon; and the piece of ice artillery, with its lavette, remained uninjured by the explosion. The illumination of the ice palace at night had an astonishingly grand effect.

HOOLE'S TRANSLATION OF LEEUWENHOEK, No. IV.
DESCRIPTION OF THE ANIMALCULE, FLOUNDER, OR
INSECT, WHICH OCCASIONS THE ROT IN SHEEP.

Illustrated with a Plate.

TO make my observations on this subject the more intelligible, I shall place them in the following order: First, as to the shape and make of this animalcule; Secondly, the part of the intestines where it is found; Thirdly, its numbers, and the manner of its propagation; and Fourthly, how these creatures, and other animalcules of a similar nature, by fixing themselves in the liver and other internal parts of the body, can produce certain diseases, and their fatal consequences.

First, as to the shape and size of this creature, and its similitude to other known animals; it bears a near resemblance (in miniature) to our sole or flounder, as appears by *fig. 1*, which represents it of the size it is commonly found; this figure shews the back or prominent side; and *fig. 2*, the belly, or flat side of it. *Fig. 3*, is one of the young of the same species, shewing the back; 4, the belly of the same; 5 and 6, are figures of the same creatures magnified, and shewn in the positions before mentioned.

These animals are not often seen alive, because the disease they produce does not always shew itself by outward tokens, and the beast afflicted with them sometimes seems fat and in good health, and then the liver is not perhaps examined till some time after the beast is killed; and these creatures cannot endure cold, but, if by being exposed to it they are deprived of motion, they will revive, if the liver be held in a warm hand, or put into warm water. Their motion is undulating or wriggling, like that of the fishes before mentioned, their colour a yellowish brown, the belly quite flat, and much paler coloured than the back; the skin rough and covered with prickles or points, and so transparent, that the bowels and vessels may plainly be seen on both sides. The head (which is shewn considerably magnified at *fig. 7*) is of a pointed form, plano-convex, that is, rounding above and flat below, the mouth projecting, open, and of an oval shape, nearly in fashion like a carp. The eyes, which are pictured separately at *fig. 8* and *9*, are very prominent, surrounded with a cartilaginous or gristly ring, and are placed, as we see in many flat fishes, both on the back, or upper side, with a division between them.

The heart is so near to the head, and the bowels so closely conjoined to the heart, that I question whether there is any thing properly to distinguish the head from the rest of the body, which yet in most animals are separate and distinct. From the heart arise two vessels spreading over the whole body, with a wide space between them, extending almost the whole length of the back, as represented at *fig. 10*, and between these vessels are many smaller ones, as shewn at *fig. 11*, which are so minute that no moisture can be discovered within them. I observed in the larger vessels, two sorts of juices, namely, in some a yellowish brown, and sometimes a kind of purple; in others a pale green; both of a glutinous or slimy nature, and yet flowing in the vessels (even after the death of the animal,) towards the heart, if held up by the tail, and back again, upon the head being raised.

The excretory duct, or passage of the bowels, is in an unusual place, being on the right side of the body, close under the head, for which
reason

reason the intestines are as it were, crowded together in an heap. There is a small protuberance at the beginning of the bowels, which I take to be the liver; and between this and the bowels, I find in all of those animalcules which I have examined, an innumerable quantity of oval particles, hundreds of which, taken together, are not equal to the size of a grain of sand. They are of a pale red colour, and I take them to be the spawn or eggs. Notwithstanding my most diligent examination of these creatures, I never could discover any difference of sexes; and it seems to me most probable, that they are of that species called Hermaphrodites, or every one equally prolific; at least, none has ever fallen into my hands which appeared plainly to be a male. The tail, though of the same texture with the rest of the body, is much tenderer, breaking or tearing upon the slightest touch.

The parts in several animals wherein I have hitherto found these creatures, are only the vessels, tubes, and channels, wherein the gall is formed and collected, though most commonly in the liver, and here they may be said to swarm, producing grievous swellings, callosities, contusions, and sinuses in the part; and cavities which will be often found an inch and an half in diameter. In those parts these noxious animalcules are found in heaps, and the places where they lie become hard and cartilaginous. In the small gall-ducts they lie longitudinally, and sometimes rolled or curled up together; and I believe that many persons have hereby been led into a mistake respecting the shape of them, describing them to be oblong round worms; but in truth, however closely they may be thus rolled up, they will spread open again, even after they are dead, upon being thrown into warm water, for then they recover their flat shape, but at the same time they become rather of a paler colour than they originally were.

These creatures are commonly found in great numbers, though in this particular they vary much, as it depends on their having had more or less time to propagate. I have taken out of one liver 870 in number, besides many fragments, and exclusive of those which were cut in pieces or destroyed in opening the liver. And in another liver I have seen but ten or twelve.

They are found in many different kinds of animals. I have been informed by hunters, that they have found them in stags, wild boars, and other kinds of game, both great and small. I myself have seen them frequently in calves, and once in a young bullock. Sheep are infested by them even from the womb of the parent, and lambs of a year old and upwards, as well as aged sheep.

As to the production and propagation of these animalcules, I consider as idle tales, what some writers assert, of their being generated by putrefaction or decayed substances, immoderate wet or heats, and other equally senseless imaginations; and I lay it down as a certain truth, that these, as well as all other small living creatures, are produced from their like, by the means of eggs, seed, or spawn, according to the nature implanted in them at their first creation. And it seems to me most probable, that these animals, with their eggs, find their way into the bodies of sheep, (and which we may suppose to be the case also with other insects and their eggs,) in the following manner; namely, that in wet summers and autumns these animalcules, which are originally bred on the surface of the earth, may, with the water in which they live, be swallowed by the sheep, and find a nidus in the liver. It must seem strange to us that a creature, originally bred in the water, should

should find a proper receptacle for its life and growth in the warm bowels of an animal; and yet we daily see leeches, which are also bred in the water, and perfectly cold themselves, suck the warm blood of the human species with an avidity scarcely to be paralleled. But, as Mr. Leeuwenhoek, in one part of his works, observes, we may wonder at these operations of nature, but admiration, and nothing more, will be the result of our cogitations. But I am not of the opinion, that after being swallowed, they do themselves force their way out of the stomach and bowels into the gall-bladder; I rather conclude, from reason and my own experience, that their spawn or eggs may, with the oily part of the chyle in the infected beast, be carried into the vessels of the gall bladder, and there fix themselves; forasmuch as these vessels are lined with a slimy and tenacious substance, and also because the gall is not like the blood, in continual circulation, but is retained in its vessels, or emitted, as the calls of the animal œconomy require. Again, they are found swarming in the liver, where they produce tumours and callosities, and cause the colour of it to change. And it seems to me not at all surprizing that these animalcules should live and be nourished in the juices of the gall, for every living creature has a situation and species of food peculiar to itself. Sea-fish die in fresh, and river-fish in salt, water. A worm cannot live in the air, and a fowl expires in the earth. What wonder is it then that the creature of which we are treating, when introduced into the body of another animal, should find its peculiar place of life, growth, and increase, in the vessels of the gall, and in the gall itself?

In the last place, like as we experience, that many living creatures are found in the human body, producing disease, pain, and death itself; so it is my opinion, that the animalcules of which I have been treating, and which are sometimes found together by thousands, may produce the following mischievous consequences:

First, the extraordinary distention of the parts where they harbour, as well by the growth and increase of their own bodies, as by the multiplication of their species or brood.

Secondly, by their biting or gnawing the parts they infest, so as at length to break or destroy their texture; and thus wholly, or in part, render them incapable of performing their functions.

Thirdly, by forcing their bodies into the small tubes and vessels, whereby the delicate frame of those tender parts is torn asunder.

Fourthly, by obstructing the passages in the vessels, whereby the circulation of the juices is prevented, and an inflammation ensues.

Fifthly, by devouring and consuming the nutritive juices, whereby the adjacent parts are deprived of their support and nourishment.

Sixthly, by clogging the vessels with their excrements, their eggs or spawn, and the bodies of such of the animalcules themselves as die, whereby, the motion of those parts being impeded, the most fatal consequences follow.

There are many other ways in which these creatures may prove noxious to animals, but those which I have here enumerated may be sufficient to give an idea of the rest.

He, then, who can find out and practise a method whereby, without injury to the parts of the body where these vermin harbour, can prevent their gnawing the parts, their creeping about in the intestines, and what is worse, their dying there, or rather, can discover how to expel them while alive out of the body, will in this respect bid fair to effect a cure.

cure. It is laid down as a truth, that a distemperature of the blood and juices, whether proceeding from an ill constitution thereof, or from an interruption in the circulation, can cause many diseases and their ill consequences: but must it therefore be deemed unreasonable to attempt proving, that animalcules being found in the juices, or even in the more solid parts of the body, may also produce diseases? The first of these points is mere matter of theory or argument; of the second, more certain proofs can be brought; consequently, it seems more rational, that those persons, who altogether rely upon their experience, should, in their enquiries, diligently investigate the reasons on which they found their opinions.

Since the perusal of this Essay, the Translator has had opportunities of conversing with several gentlemen, conversant in the grazing of sheep, from whom he has collected the following particulars:

That in very wet seasons, particularly towards the latter end of the year, a species of grass springs up in the low and wet lands, by feeding on which the sheep are supposed to contract the distemper called the rot. That, if the rains do not abound until after the winter frost has been experienced, the sheep are not then obnoxious to this disease, but otherwise if a wet season precedes the frost; and lastly, that sheep infected with this disease do for a time appear fat and healthy, but, when the disorder gets to a height, they fall away rapidly.

These particulars seem to prove, that the disease called the rot in sheep does in fact proceed from the animal described in the preceding Essay, which being bred in the marshes, and adhering, with its eggs, to the grass growing in watery places, is swallowed by the sheep. And it is probable that when the frost precedes a wet season, the animalcules and their eggs are killed by the frost, and consequently the sheep escape; we may also conclude, that, while this noxious animalcule is in an infant state in the bowels of the sheep, it may not be particularly injurious, but when it arrives at a size to prey upon the liver, first a sickness, and waiting in the animal, and afterwards death, must ensue; and the Translator has been informed by a gentleman's gamekeeper, that he has frequently found hares dead of this disease, and that, upon opening them, hundreds of the animalcules were found in their livers.

The animalcule before described is called in some countries a Fluke, in others a Loop, but most generally a Flounder, probably from the resemblance it bears to the fish of that name.

Several receipts for the Rot have been published at different times, of which the most approved have been already given in the annexed Natural History, vol. iii. p. 129, &c. to which we refer the reader.

A remedy for this disease has also been lately offered to the public, under sanction of letters patent, granted to the discoverer, Mr. Thomas Fleet, an opulent farmer, at Preston Candover, near Basingstoke, in Hampshire. The patent sets forth the ingredients as follows: Turpentine, bole-armenic, turmeric, quicksilver, brimstone, salt, opium, alkanet-root, bark, antimony, camphor, and distilled water; to be prepared according to chemical, and compounded according to medical, art.

THE NEWLY ELECTED POPE, PIUS VII.

PIUS the VIIth, whose secular name was Gregory Barnabas Chiaramonte, was born in the year 1742, in the small town of Cesena, in Romagna, already honoured by the birth of his immediate predecessor.

for, the late Pius VI. He was also, like him, descended from a noble but reduced family; his father had the title of *Count*; and his ancestors, although settled in Italy, and ranked in the Cefenate nobility for many centuries past, were accounted of a French extraction, and supposed to have come from the town of *Clermont*, in Auvergne, whence the Italian name of *Chiaromonte* was derived.

His holiness evinced, from his earliest years, a sober and a sedate mind, an uncommon diligence in studies, and a degree of prudence much superior to what can generally be expected from young people of a tender age. His friends, therefore, were not long in concluding from such dispositions, that a quiet, retired, and contemplative, life, would be suitable to him; and resolved, of course, that he should take the religious habit in a monastic order competent to his rank. Accordingly he was, in his 16th year, received into the Benedictine; an order which, from its very foundation, has been, in Italy at least, the exclusive sanctuary of the highest nobility; and, very often, the asylum of princes and kings disappointed in the world.

The career of Chiaromonte in the claustral dignities was neither rapid nor brilliant; but, what is perhaps better, regular, rational, and analogous to his character. No sooner had he become a priest, than he was by his superiors summoned to Rome, for the purpose of taking his residence in the large convent of St. Paul, in that metropolis, accounted the richest Benedictine community in the papal dominions; and known, in all Europe, for being contiguous and subservient to the famous Basilic of the same name. There he was for several years instructor of novices; next, professor of divinity; and, when near forty, abbot, a conspicuous and independent dignity, and the highest preferment ever to be hoped by a Benedictine; as, according to a standing and unalterable article of their constitution, there cannot exist either a general of the order, or any other chief above the abbots.

His conduct, whilst abbot of St. Paul, was such as had been predicted by those who were acquainted with his character; an inflexible supporter of the monastic discipline, and, at the same time, an accomplished gentleman in mildness, affability, and politeness. It was usual for him to spend the whole winter in the convent of St. Paul, and the remainder of the year in that of St. Calisto, in Trastevere; as the former place, owing to the stagnation of waters in the Tyber, was unwholesome and dangerous in summer time. His income, as abbot, was full 5000 Roman crowns (1000l. sterling), of which the greatest part he bestowed in acts of charity, chiefly directed to relieve honest families in distress.

Eminent merit, howsoever it may be concealed in the recesses of obscurity, or wrapped in the veil of modesty, cannot fail at length to transpire and attract the public notice. Chiaromonte, quite unexpectedly, was, by the late pope, his countryman, appointed bishop of Tivoli, in the neighbourhood of Rome. This election did certainly great honour to Pius VI. as it proved how sagacious he was in discovering, and forward in promoting, a worthy clergyman out of the circle of an ambitious court. As to the candidate himself, however, it must, we venture to say, have been utterly indifferent; for, except the honour of belonging actually to the secular hierarchy of the Roman clergy, and the vanity, if he had any, of being *à claustris in aulam revocatus*, he was rather a loser through the promotion. The bishopric of Tivoli yielded little above 5000 crowns, and his holiness was too good a clergyman, and too well aware of the ecclesiastical laws, not to know that the
income

income of a bishop is, more rigorously than that of a Benedictine abbot, the estate of the poor.

His holiness had hitherto displayed his moral character, merely as a chief of a religious order; and his intellectual powers, only as an excellent divine. His new dignity soon enabled him to acquire also the reputation of a suitable governor to a secular clergy, and of an eminent canonist and civilian. Never, perhaps, the diocese of Tivoli was happier, than under his episcopate. He was a severe guardian of the morals of his clergy, and an attentive observer of their improvement in science. He punished their faults rigorously, and, nevertheless, he was generally beloved by them. He performed towards the people at large all the duties of his station, and, very often, the functions of a common clergyman; and, as his religious sentiments had no mixture of hypocrisy or fanaticism, he sometimes indulged in the pleasures of society, spent his evenings in familiar conversations with a select number of friends; and, when he had opportunities, gave also concerts of music in his palace, where ladies and gentlemen were admitted, and treated with uncommon kindness and liberality. The consequence of this behaviour towards the Tivolese was their universal regret, when he happened three years after to be promoted to the bishopric of Imola, in Romagna, and to the cardinalship.

The bishopric of Imola is one of the best benefices of the kind in the Roman state. It yields upwards of 12,000 crowns (nearly 2500l. sterling.) Chiaramonte was, however, far from being rich, as a cardinal, by the sole revenues of his episcopal see; and, by a peculiar circumstance which is deserving of record, he was not able to obtain any farther favour from his court, at the time of his promotion to the purple, as he might justly have expected, and as it really was the custom of the papal government in such cases. The late pope had, contemporarily with him, conferred the same dignity on two Neapolitan prelates, residing in Rome, Pignatelli and Ruffo, in hopes that his Sicilian majesty would grant to these two cardinals, his subjects, some of the rich abbeys in the kingdom of Naples, which then happened to be vacant. Pius VI. was, as usual, disappointed by the noted cabals of the Neapolitan *Paglietti* and *Pulcinelli*. He felt, therefore, the necessity of providing for Ruffo and Pignatelli many commanderies, abbeys, and benefices, in the Roman state; and was obliged, of course, to deprive his own subjects of these important emoluments.

The Bishop of Imola always lived in his diocese, and very seldom visited Rome. For, besides the sense of his pastoral duties towards his clergy and people, he might also have been induced to keep far from the metropolis, by the additional consideration that he was not able to support, with his small income, the high style of a cardinal at court.

On the 11th of March last, in the 58th year of his age, he was elected pope by the conclave at Venice, and proclaimed under the name of Pius the VIIth; with the highest rejoicings of the Venetians, and the general satisfaction of all the Italians. He is the first Benedictine monk who has occupied the papal throne, in modern times; as it is known that the illustrious order of St. Benedict had, in the middle ages, governed the church almost exclusively, for nearly three centuries, and occasioned of course a convention, that no individual belonging to it should ever after be elected pope.

ON CASUAL MUTILATIONS BECOMING HEREDITARY MARKS OF DISTINCTION.

THAT it is possible for mutilations produced in the bodies of animals, either by accident or by artificial means, especially when repeated through a whole series of generations, to degenerate in the course of time into hereditary marks of distinction, seems *à priori* to be incontrovertible. At any rate, who can assign a reason why this should not be as possible as the transmission of hereditary organic diseases, or hereditary monstrosities, or the most individual traits in family likenesses, such as a thick under-lip, strong eye-brows, and so on, which certainly did not all descend from Adam; but which have first appeared at a certain generation, and since that period have been continued, with more or less constancy, by hereditary transmission.

Instances among Animals.—We shall begin with a recent one, mentioned by M. Schulz in his *Observations*, p. 17. “A Spanish bitch,” says he, “which had been in my possession for several years, was not only brought forth without a tail, but at various times produced puppies some of whom were destitute of tails also. As often as this bitch brought forth more than one puppy, one of them, perhaps, was quite perfect; the greater part, however, had half tails or tails still shorter, and one at least had no tail at all. The most singular thing was, that the young almost always had a resemblance to the father, whether grey-hound, spaniel, &c. in regard to colour and bodily conformation; and deriving nothing more from their mother, the Spanish bitch, than the singularity of having only the third part of a tail, or no tail at all.”

We are told by Sir Kenelm Digby, that, the tail of a cat having been cut off when young, some of the kittens which she afterwards brought forth were always without tails. Nathaniel Highmore, who, in explaining the nature of generation, differs so much from Sir Kenelm, says, that he saw a bitch which wanted almost the whole tail from the rump, and that the half of her young were brought into the world with tails; and the other half without. Buffon asserts, that he saw dogs, the ears and tails of which had been cropped for many generations, and which transferred this mutilation, either totally or in part, to their posterity. M. R. Masch, of New Strelitz, gives an account, in the *Naturforscher*, of a butcher's dog, the tail of which, according to custom, had been cut off, and which having copulated with a she-wolf, that had been caught, the latter produced three bastards. Among these was a male, half grey like the father, and born with a cropped tail; so that the casual mutilation of the dog, as the author says, was transferred to this bastard.

We are told by D. Forster, that it has been remarked in England, that when horses are continually docked, and both stallions and mares kept so for many generations, the foals, at last, come into the world with some articulations fewer in the tail. Buffon has enlarged pretty fully on this subject, and endeavoured to prove, by the help of anatomy, that the callosities on the breast-bone and knees of the camel are merely the consequence of their subjection, and the force by which these animals of burden, as is well known, are obliged to kneel down; and as the young camels, when brought forth, have callosities of the like kind, he gives this as a proof of the hereditary transmission of such variations produced by art.

Instances

Instances among the Human Species.—Cardan speaks of the well-known ancient custom of the Peruvians of Puerto Viego, who pressed between boards the heads of their new-born children. This custom, however, became afterwards like a second nature; so that, in the course of time, children were brought into the world with heads formed in that singular manner: and Cardan expressly says, that this flatness of the head was originally the work of art, and not of nature. Hippocrates, in his work upon air, water, and climate, mentions something of the like kind in regard to the Macrocephali, a people on the borders of the Black Sea, who pressed the heads of their new-born children; and this practice repeated, through many generations, produced at length an hereditary distinction; so that the children were born with heads of a particular form. "At first," says he, "the practice of the country seems to have been the cause of this conformation; but custom afterwards became nature. Those who had the largest heads were considered as the noblest; and for this reason the Macrocephali pressed the yet pliable tender heads of their children with their hands, and forced them to extend in length by bandages and other means. This artificial process gave occasion to the subsequent increase of size in the head among these people, so that artificial means were no longer requisite for that purpose." Hippocrates, however, adds in a short section, "That in his time their heads had no longer that singular form completely, because they had entirely neglected the above artificial means of formation." But that this very little contradicts his preceding account and opinion is shewn by the intermediate passages, where he endeavours to explain the phenomenon from his well-known theory of generation: "The generative matter," says he, "is collected from all parts of the body; from sound bodies it comes sound, and from diseased bodies diseased: now, as bald heads, blue eyes, and over-grown bodies, are transmitted in families, and the like rule takes place in other circumstances of conformation, why should not children, with great heads, be produced by great-headed parents?" Hippocrates, therefore, evidently meant only that in the course of time nature sometimes abandons forms she has assumed, and returns again to the original.

Aristotle, in his work on the generation of animals, speaking of the grounds on which the theory of Hippocrates respecting generation is founded, says: "It is very probable for this reason, besides others, that children not only resemble their parents in internal and innate properties, but even in external marks which are merely casual; for there are instances of moles being transmitted from parents to their children, and on the very same parts of the body." He himself quotes a Chaldean, who, having a mole on his arm, transmitted it to his son, though in the latter it was not so apparent as in the father. Pliny also, where he treats of marks, moles, and the like, being sometimes inherited by children, adds, by way of example: *Quarto partu Dacorum originis nota in brachio redditur*. In my opinion, this passage alludes to the hereditary transmission of moles among the Dacians, Illyrians, &c. who, according to the testimony of many of the ancients, were distinguished by this singularity.

A staff-officer, who lived in the neighbourhood of Stockholm, in his younger days, had received a wound in the little finger of his right hand, which had been rendered crooked during the cure; and his son and daughter were born each with the little finger of the same hand crooked.

Professor

Professor Blumenbach adds some very curious information on this subject:—"A literary man, of very great acuteness, when conversing with me on this subject, started the following objection: If artificial mutilations can become hereditary, children born of circumcised parents must often be born without the foreskin, which does not appear to be the case. At that time I was acquainted with only one instance of this kind in Steph. Gerlach's Journal; but one example did not appear to me to be of any peculiar weight. I, however, once happened to ask a Jew of this place, a man not destitute of learning, and well acquainted with the ritual of his nation respecting this circumstance, and was told that it frequently happened that the children of the Jews were brought into the world with so short a foreskin that it required an experienced and careful hand to circumcise them. This innate deficiency is distinguished by a particular Hebrew appellation, *nauld mohl*, or born circumcised. His own father, who had circumcised above 700 boys, and who was celebrated on account of his expertness in this case, not at all uncommon, often spoke of the difficulty of performing the operation under such circumstances. In a word, what had appeared to me an argument against the hereditary transmission of artificial mutilations, became unexpectedly an important argument in its favour. I will, however, readily acknowledge, that all the cases above mentioned may not be of equal authenticity, and equally incontrovertible; but even though the least improbable should be rejected, there will still remain, to support the probability of the thing, as many as could be desired for a proposition which cannot well be proved by direct experiments made for the purpose."

ACCOUNT OF THE PEARL FISHERY IN THE GULPH OF MANAR, 1797. By HENRY J. LE BECK, *Esq*;

FROM the accounts of the former pearl fisheries at Ceylon, it will be found, that none have ever been so productive as this year's. It was generally supposed that the renter would be infallibly ruined, as the sum he paid for the present fishery was thought exorbitant when compared with what had been formerly given: but this conjecture in the event appeared ill-founded, as it proved extremely profitable and lucrative.

The farmer this time was a Tamul merchant, who, for the privilege of fishing with more than the usual number of donies or boats, paid between two and three hundred thousand Porto-novo pagodas; a sum nearly double the usual rent.

These boats he farmed out again to individuals in the best manner he could; but, for want of a sufficient number of divers, some of them could not be employed.

The fishing, which commonly began about the middle of February, if wind and weather allowed, was this year, for various reasons, delayed till the end of the month; yet, so favourable was the weather, that the renter was able to take advantage of the permission granted by the agreement, to fish a little longer than the usual period of thirty days.

The fishery cannot well be continued after the setting-in of the southern monsoon, which usually happens about the 15th of April, as, after that time, the boats would not be able to reach the pearl banks, and the water being then so troubled by heavy seas, diving would be impracticable; in addition to which, the sea-weed, a species of *fucus*, driven in by the southerly wind, and which spreads to a considerable distance from the shore, would be an impediment.

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Many of the divers, being Roman Catholics, leave the fishery on Sundays to attend divine service in their church at Aripoo; but if either a Mahomedan or Hindoo festival happens during the fishing days, or if it is interrupted by stormy weather, or any other accident, this lost time is made up by obliging the Catholics to work on Sundays.

The fear of sharks is also another cause of interruption. These, amongst some others, are the reasons that, out of two months, (from February till April,) seldom more than thirty days can be employed in the fishery.

As this time would be insufficient to fish all the banks (each of which has its appropriate name, both in Dutch and Tamul,) it is carried on for three or four successive years, and a new contract annually made, till the whole banks have been fished; after which they are left to recover.

The length of time required for this purpose, or from one general fishing to another, has not yet been exactly determined; it was, therefore, a practice to depute some persons to visit the banks annually, and to give their opinion, whether a fishery might be undertaken with any degree of success?

From various accounts, which I have collected from good authority, and the experience of those who assisted at such examinations, I conjecture, that every seven years such a general fishery could be attempted with advantage, as this interval seems sufficient for the pearl shells to attain their growth: I am also confirmed in this opinion by a report, made by a Dutch governor at Jafnas, of all the fisheries that have been undertaken at Ceylon since 1722; a translation of which is to be found in Wolfe's Travels into Ceylon. But the ruinous condition in which the divers leave the pearl banks at each fishery, by attending only to the profit of individuals, and not to that of the public, is one great cause that it requires twice the above-mentioned space of time, and sometimes longer, for rendering the fishing productive. They do not pay the least attention to spare the young and immature shells that contain no pearl; heaps of them are seen thrown out of the boats as useless on the beach between Manar and Aripoo: if these had been suffered to remain in their native beds, they would, no doubt, have produced many fine pearls. It might, therefore, be advisable to oblige the boat-people to throw them into the sea again before the boats leave the bank. If this circumspection, in sparing the small pearl shells to perpetuate the breed, was always observed, succeeding fisheries might be expected sooner, and with still greater success: but the neglect of this simple precaution will, I fear, be attended with similar fatal consequences here, as have already happened to the pearl banks on the coast of Persia, South America, and Sweden, where the fisheries are by no means so profitable at present as they were formerly.

Another cause of the destruction of numbers of both old and young pearl-shells is the anchoring of so many boats on the banks; almost all of them use differently formed, clumsy, heavy, wooden anchors, large stones, &c. &c. If this evil cannot be entirely prevented, it might, at least, be greatly lessened, by obliging them all to use anchors of a particular sort, and less destructive.

This season the Seewel Bank only was fished, which lies above twenty miles to the westward of Aripoo, opposite to the fresh water rivers of Moofalee, Modragam, and Pomparipoo. It has been observed, that the pearls on the north-west part of this bank, which consists of
rock,

rock, are of a clearer water than those found on the south-east, nearest the shore, growing on corals and sand.

Condatchy is situated in a bay, forming nearly a half-moon, and is a waste sandy district, with some miserable huts built on it. The water is bad and brackish, and the soil produces only a few, widely scattered, stunted trees and bushes. Those persons who remain here during the fishery are obliged to get their water for drinking from Aripoo, a village with a small old fort, lying about four miles to the southward. Tigers, porcupines, wild hogs, pangolines, or the *Ceylon armadillos*, are, amongst other quadrupeds, here common. Of amphibia, there are tortoises, especially the *testudo geometrica*, and various kinds of snakes. A conchologist meets here with a large field for his enquiries. The presents which I made to the people employed in the fishery, to encourage them to collect all sorts of shells which the divers bring on shore, produced but little effect; as they were too much taken up in searching after the mother-of-pearl shells to pay attention to any other object. However, my endeavours were not entirely useless; I will specify here a few of the number I collected during my stay: different kinds of *pectines*, *palium porphyreum*, *solen radiatus*, *Venus castrensis* Linn. *astrea hyotis*, *ostr. Forskolii*, *ostr. Malleus*, *mytilus hirundo* Linn. *spondilus crucius*, *pholas pusillus* Linn. *mitra episcopalis* Linn. *lepas striata* Pennanti, (*vide Zool. Brit.*) *patella tricarinata* Linn. *bulia perfecta maculata*, *narpa nobilis*, *porcellana salita* Rumph. *strombus scorpio*, and other of inferior kinds. Amongst the *zoophytes*, many valuable species of *spongia*, *corallineæ*, *satulariæ*, &c. a great variety of sea-stars, and other marine productions, that cannot be preserved in spirits, but should be described on the spot. These, as well as the description of the different animals inhabiting the shells, are the more worthy of our attention, and deserve farther investigation, as we are yet very deficient in this branch of natural history.

During the fishing season, the desert barren place, Condatchey, offers to our view a scene equally novel and astonishing. A heterogeneous mixture of thousands of people, of different colours, countries, casts, and occupations; the number of tents and huts erected on the sea-shore, with their shops or bazars before each of them; and the many boats returning on shore in the afternoon, generally richly laden; all together form a spectacle entirely new to an European eye. Each owner runs to his respective boat as soon as it reaches the shore, in hopes of finding it fraught with immense treasure, which is often much greater in imagination than in the shell; and, though he is disappointed one day, he relies with greater certainty on the next, looking forward to the fortune promised him by his stars, as he thinks it impossible for the astrological predictions of his Brahmen to err.

To prevent riot and disorder, an officer with a party of Malays is stationed here. They occupy a large square, where they have a field-piece, and a flag-staff for signals.

Here and there you meet with brokers, jewellers, and merchants, of all descriptions; also sutlers, offering provisions and other articles to gratify the sensual appetite and luxury. But by far the greater number are occupied with the pearls. Some are busily employed in assorting them; for which purpose they make use of small brass plates perforated with holes of different sizes; others are weighing, and offering them to the purchaser; while others are drilling or boring them, which they perform for a trifle.

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The instrument these people carry about with them for this purpose is of a very simple construction, but requires much skill and exercise to use it; it is made in the following manner: The principal part consists of a piece of soft wood, of an obtuse, inverted, conical shape, about six inches high and four in diameter in its plain surface; this is supported by three wooden feet, each of which is more than a foot in length. Upon the upper flat part of this machine are holes or pits for the larger pearls, and the smaller ones are beat in with a wooden hammer. On the right side of this stool, half a cocoa-nut shell is fastened, which is filled with water. The drilling instruments are iron spindles, of various sizes, adapted to the different dimensions of the pearls, which are turned round in a wooden head by a bow. The pearls being placed on the flat surface of the inverted cone, as already mentioned, the operator, sitting on a mat, presses on the wooden head of his instrument with the left hand, while, with his right, he moves the bow which turns round the moveable part of the drill; at the same time he moistens the pearl, occasionally dipping the little finger of the same hand into the water of the cocoa-nut shell with a dexterity that can only be attained by constant practice.

Amongst the crowd are found vagabonds of every description, such as pandarams, Andee or Hindu monks, fakirs, beggars, and the like, who are impertinently troublesome. Two of these wretches particularly attracted the attention of the mob, though their superstitious penance must have disgusted a man of the least reflection: one had a grid-iron, of one foot and a half long, and the same in breadth, fastened round his neck, with which he always walked about, nor did he take it off either when eating or sleeping; the other had fastened round that member which decency forbids me to mention, a brass ring, and fixed to it was a chain, of a fathom in length, trailing on the ground; the links of this chain were as thick as a man's finger, and the whole was exhibited in a most scandalous manner.

The pestilential smell occasioned by the numbers of putrefying pearl fishes, renders the atmosphere of Condatchey so insufferably offensive when the south-west wind blows, that it sensibly affects the olfactory nerves of any one unaccustomed to such cadaverous smells. This putrefaction generates immense numbers of worms, flies, muskitoes, and other vermin, all together forming a scene strongly displeasing to the senses.

Those who are not provided with a sufficient stock of money suffer great hardships, as not only all kinds of provisions are very dear, but even every drop of good water must be paid for. Those who drink the brackish water of this place are often attacked by sickness. It may easily be conceived what an effect the extreme heat of the day, the cold of the night, the heavy dews, and the putrid smell, must have on weak constitutions. It is, therefore, no wonder, that of those who fall sick many die, and many more return home with fevers, fluxes, or other equally fatal disorders.

The many disappointments usually experienced by the lower classes of men in particular, make them often repent of their coming here. They are often ruined, as they risk all they are worth to purchase pearl shells: however, there are many instances of their making a fortune beyond all expectation. A particular circumstance of this kind fell within my own observation: a day labourer bought three oysters for a

copper fanam, (about the value of two-pence,) and was so fortunate as to find one of the largest pearls which the fishery produced this season.

The donies appointed for the fishery are not all procured at Ceylon; many came from the coasts of Coromandel and Malabar, each of which has its distinguishing number. About ten o'clock at night a gun is fired as a signal, when they sail from Condatchey with an easterly or land wind, under the direction of a pilot. If the wind continues fair, they reach the bank before day, and begin diving at sun-rise, which they continue till the west or sea-breeze sets in, with which they return. The moment they appear in sight, the colours are hoisted at the flag-staff, and in the afternoon they come to an anchor; so that the owners of the boats are thereby enabled to get their cargoes out before night, which may amount to 30,000 oysters, if the divers have been active and successful.

Each boat carries twenty-one men and five heavy diving-stones, for the use of ten divers, who are called in Tamul *kooly kârer*; the rest of the crew consists of a tandel, or head boatman, and ten rowers, who assist in lifting up the divers and their shells.

The diving-stone is a piece of coarse granite, a foot long, six inches thick, and of a pyramidal shape, rounded at the top and bottom. A large hair rope is put through a hole in the top. Some of the divers use another kind of stone, shaped like a half moon, to bind round their belly, so that their feet may be free. At present these are articles of trade at Condatchey. The most common, or pyramidal stone, generally weighs about thirty pounds. If a boat has more than five of them, the crew are either corporally punished or fined.

The diving, both at Ceylon and Tutucorin, is not attended with so many difficulties as authors imagine. The divers, consisting of different casts and religions, (though chiefly of Parrawer and Mussulmans,) neither make their bodies smooth with oil, nor do they stop their ears, mouths, or noses, with any thing, to prevent the entrance of salt water. They are ignorant of the utility of diving-bells, bladders, and double flexible pipes. According to the injunctions of the shark conjurer, they use no food while at work, nor till they return on shore and have bathed themselves in fresh water. These Indians, accustomed to dive from their earliest infancy, fearlessly descend to the bottom, in a depth of from five to ten fathoms, in search of treasures. By two cords a diving-stone and a net are connected with the boat. The diver, putting the toes of his right foot on the hair rope of the diving stone, and those of his left on the net, seizes the two cords with one hand, and, shutting his nostrils with the other, plunges into the water. On reaching the bottom, he hangs the net round his neck, and collects into it the pearl shells as fast as possible during the time he finds himself able to remain under water, which usually is about two minutes. He then resumes his former posture, and making a signal, by pulling the cords, he is immediately lifted into the boat. On emerging from the sea, he discharges a quantity of water from his mouth and nose, and those who have not been long enured to diving, frequently discharge some blood; but this does not prevent them from diving again in their turn. When the first five divers come up, and are respiring, the other five are going down with the same stones. Each brings up about one hundred oysters in his net, and, if not interrupted by any accident, may make fifty trips in a forenoon. They and the boat's crew get generally from the owner, instead of money, a fourth of the quantity which they bring on shore; but some are paid in cash, according to agreement.

The most skilful divers come from Collish, on the coast of Malabar; some of them are so much exercised in the art, as to be able to perform it without the assistance of the usual weight, and for a handsome reward will remain under water for the space of seven minutes: this I saw performed by a Caffry boy, belonging to a citizen at Karical, who had often frequented the fisheries of these banks. Though Dr. Halley deems this impossible, daily experience convinces us, that, by long practice, any man may bring himself to remain under water above a couple of minutes. How much the inhabitants of the South-Sea Islands distinguish themselves in diving we learn from several accounts; and who will not be surprised at the wonderful Sicilian diver Nicolas, surnamed the Fish?

Every one of the divers, and even the most expert, entertain a great dread of the sharks, and will not, on any account, descend until the conjurer has performed his ceremonies. This prejudice is so deeply rooted in their minds, that the government was obliged to keep two such conjurers always in their pay, to remove the fears of their divers. Thirteen of these men were now at the fishery from Ceylon and the coast to profit by the superstitious folly of these deluded people. They are called in Tamul *Pillāl Kadiār*, which signifies one who binds the sharks, and prevents them from doing mischief.

The manner of enchanting consists in a number of prayers learned by heart, that nobody, probably not even the conjurer himself, understands, which he, standing on the shore, continues muttering and grumbling from sun-rise until the boats return: during this period they are obliged to abstain from food and sleep, otherwise their prayers would have no avail; they are, however, allowed to drink, which privilege they indulge in a high degree, and are frequently so giddy as to be rendered very unfit for devotion. Some of the conjurers accompany the divers in their boats; which pleases them very much, as they have their protectors near at hand. Nevertheless, I was told, that in one of the preceding fisheries a diver lost his leg by a shark; and, when the head conjurer was called to an account for the accident, he replied, that an old witch had just come from the coast, who, from envy and malice, had caused this disaster by a counter-conjuration, which made fruitless his skill, and of which he was informed too late: but he afterwards shewed his superiority by enchanting the poor sharks so effectually, that, though they appeared in the midst of the divers, they were unable to open their mouths. During my stay at Condatchey, no accident of this kind happened. If a shark is seen, the divers immediately make a signal, which on perceiving, all the boats return instantly. A diver who trod upon a hammer-oyster, and was somewhat wounded, thought he was bit by a shark, consequently made the usual signal; which caused many boats to return; for which mistake he was afterwards punished.

The owners of the boats sometimes sell their oysters, and at other times open them on their own account. In the latter case, some put them on mats in a square, surrounded with a fence; others dig holes of almost a foot deep, and throw them in till the animal dies; after which they open the shells, and take out the pearls with more ease. Even these squares and holes are sold by auction after the fishery is finished, as pearls often remain there mixed with the sand.

In spite of every care, tricks in picking out the pearls from the oysters can hardly be prevented. In this the natives are extremely dexterous. The following is one mode they put in practice to effect their purpose:

purpose: when a boat-owner employs a number of hired people to collect pearls, he places over them an inspector of his own, in whom he can confide; these hirelings previously agree that one of them shall play the part of a thief, and bear the punishment, to give his comrades an opportunity of pilfering. If one of the gang happens to meet with a large pearl, he makes a sign to his accomplice, who instantly conveys away one of small value, purposely, in such a manner as to attract notice. On this the inspector and the rest of the men take the pearl from him: he is then punished, and turned out of their company. In the mean time, while he is making a dreadful uproar, the real thief secures the valuable pearl, and afterwards the booty is shared with him who suffered for them all. Besides tricks like these, the boat-owners and purchasers often lose many of the best pearls while the dony is returning from the bank; for, as long as the animal is alive, and untouched, the shells are frequently open near an inch; and if any of them contain a large pearl, it is easily discovered, and taken out by means of a small piece of stiff grass, or bit of stick, without hurting the pearl fish. In this practice they are extremely expert. Some of them were discovered whilst I was there, and received their due punishment.

Gmelin asks, if the animal of the *mytilus margariferus* is an *ascidia*? This induces me to believe, that it has never yet been accurately described; it does not resemble the *ascidia* of Linnæus, and may, perhaps, form a new genus. It is fastened to the upper and lower shells by two white flat pieces of muscular substance, which are called by Houttuin *ears*, and extend about two inches from the thick part of the body, growing gradually thinner. The extremity of each ear lies loose, and is surrounded by a double brown fringed line. These lie almost the third of an inch from the outer part of the shell, and are continually moved by the animal. Next to these, above and below, are situated two other double fringed moveable substances, like the branchiæ of a fish. These ears and fringes are joined to a cylindrical piece of flesh of the size of a man's thumb, which is harder and of a more muscular nature than the rest of the body. It lies about the center of the shells, and is firmly attached to the middle of each. This, in fact, is that part of the pearl fish which serves to open and shut the shells. Where this column is fastened, we find on the flesh deep impressions, and on the shell various nodes of round or oblong forms, like imperfect pearls. Between this part and the hinge, *cardo*, lies the principal body of the animal, separated from the rest, and shaped like a bag. The mouth is near the hinge of the shell, enveloped in a veil, and has a double flap or lip on each side; from thence we observe the cesophagus descending like a thread to the stomach. Close to the mouth there is a curved brownish tongue, half an inch in length, with an obtuse point; on the concave side of this descends a furrow, which the animal opens and shuts, and probably uses to convey food to its mouth. Near its middle are two bluish spots, which seem to be the eyes. In a pretty deep hole, near the base of the tongue, lies the beard, *byssus*, fastened by two fleshy roots, and consisting of almost one hundred fibres, each an inch long, of a dark green colour, with a metallic lustre; they are undivided, parallel, and flattened. In general, the beard is more than three quarters of an inch without the cleft, *rima*; but if the animal is disturbed, it contracts it considerably. The top of each of these threads terminates in a circular gland or head, like the stigma of many plants. With this byssus they fasten themselves to rocks, corals, and other solid bodies; by it the young pearl fish cling to the

the old ones, and with it the animal procures its food, by extending and contracting it at pleasure. Small shell-fish, on which they partly live, are often found clinging to the former. The stomach lies close to the root of the beard, and has, on its lower side, a protracted obtuse point. Above the stomach are two small red bodies, like lungs; and from the stomach goes a long channel or gut, which takes a circuit round the muscular column above-mentioned, and ends in the anus, which lies opposite to the mouth, and is covered with a small thin leaf, like a flap. Though the natives pretend to distinguish the sexes by the appearance of the shell, I could not find any genitalia. The large flat ones they call males, and those that are thick, concave, and vaulted, they call females, or *pedoo-chippy*; but, on a close inspection, I could not observe any visible sexual difference.

It is remarkable that some of these animals are as red as blood, and that the inside of the shell has the same colour, with the usual pearly lustre; though my servants found a reddish pearl in an oyster of this colour, yet such an event is very rare. The divers attribute this redness to the sickness of the pearl-fish, though it is most probable that they had it from their first existence. In the shade they will live twenty-four hours after being taken out of the water. This animal is eaten by the lower class of Indians, either fresh in their curries, or cured by drying; in which state they are exported to the coast; though I do not think them by any means palatable.

Within a mother-of-pearl shell I found thirteen *murices nudati*, the largest of which was three quarters of an inch long; but, as many of them were putrid, and the pearl-fish itself dead, I could not ascertain whether they had crept in as enemies, or were drawn in by the animal itself. At any rate turtles and crabs are inimical to the animals, and a small living crab was found in one of them.

The pearls are only in the softer part of the animal, and never in that firm muscular column above-mentioned. We find them in general near the earth, and on both sides of the mouth. The natives entertain the same foolish opinion concerning the formation of the pearl which the ancients did: they suppose them formed from dew-drops in connection with sun-beams. A Brahmen informed me, that it was recorded in one of his Sanscrit books, that the pearls are formed in the month of May at the appearance of the Soatee star (one of their twenty-seven constellations), when the oysters come up to the surface of the water to catch the drops of rain. One of the most celebrated conchologists supposes that the pearl is formed by the oyster in order to defend itself from the attacks of the *pholades* and *boreworms*. But we may be assured that in this supposition he is mistaken; for, although these animals often penetrate the outer layers of the pearl shell, and there occasion hollow nodes, yet, on examination, it will be found that they are never able to pierce the firm layer with which the inside of the shell is lined. How can the pearls be formed as a defence against exterior worms, when, even on shells that contain them, no worm-holes are to be seen? It is, therefore, more probable these worms take up their habitations in the nodes in order to protect themselves from the attacks of an enemy, than that they are capable of preying on an animal so well defended as the pearl-fish is. It is unnecessary to repeat the various opinions and hypotheses of other modern authors; it is much easier to criticise them, than to substitute in their place a more rational theory. That of Reaumur, mentioned in the memoirs of the French Academy

for

for 1712, is the most probable, viz. that the pearls are formed like bezoars and other stones in different animals, and are apparently the effects of a disease. In short, it is very evident that the pearl is formed by an extravasation of a glutinous juice, either within the body, or on the surface of the animal: the former case is the most common. Between one and two hundred pearls have been found within one oyster. Such extravasations may be caused by heterogeneous bodies, such as sand, coming in with the food, which the animal, to prevent disagreeable friction, covers with its glutinous matter, and which, as it is successively secreted, forms many regular lamellæ in the manner of the coats of an onion, or like different strata of bezoars, only much thinner; this is probable, for if we cut through the center of a pearl, we often find a foreign particle, which ought to be considered as the nucleus, or primary cause of its formation. The loose pearls may originally have been produced within the body, and, on their increase, may have separated and fallen into the cavity of the shell. Those compact ones, fixed to the shells, seem to be produced by similar extravasation, occasioned by the friction of some roughness on the inside of the shell. These and the pearl-like nodes have a different aspect from the pearls, and are of a darker and bluer colour. In one of the former I found a pretty large, true, oval pearl, of a very clear water; while the node itself was of a dark blueish colour. The yellow, or gold-coloured pearl, is the most esteemed by the natives; some have a bright red lustre; others are grey, or blackish, without any shining appearance, and of no value. Sometimes, when the grey lamella of a pearl is taken off, under it is found a beautiful genuine one; but it often happens that, after having separated the first coat, you find a worthless impure pearl. I tried several of them, taking one lamella off after another, and found clear and impure by turns; and in an impure pearl I met with one of a clear water, though in the centre of all I found a foreign particle. The largest and most perfect pearl which I saw during my stay at Condatchey was about the size of a small pistol bullet, though I have been told since my departure many others of the same size have been found. The spotted and irregular ones are sold cheap, and are chiefly used by the native physicians as an ingredient in their medicines.

We may judge with greater or less probability, by the appearance of the pearl shell, whether they contain pearls or not. Those that have a thick calcareous crust upon them, to which *serpula* (sea tubes), *Tubuli marini irregulariter intorti*, *Crista-gali Chamar lazuras*, *Lepas tintinabulum*, *Madreporee*, *Millipore*, *Cellipore*, *Gorgontæ*, *Spongiæ*, and other zoophytes, are fastened, have arrived at their full growth, and commonly contain the best pearls; but those that appear smooth, contain either none, or small ones only.

Were a naturalist to make an excursion for a few months to Manar, the small island near Jafna, and the adjacent coast, he would discover many natural curiosities still buried in obscurity, or that have never been accurately described.

Indeed no place in the East Indies abounds more with rare shells than these; for there they remain undisturbed, by being sheltered from turbulent seas, and the fury of the surf.

The great success of the Rev. Doctor John, in conchology, when at Tutucorin, and assisted by G. Angelbeck, with a boat and divers; and the capital collections made by his agents, whom he afterwards sent there with the necessary instructions and apparatus, may be seen in Chemnitz's

Chemnitz's elegant Cabinet of Shells, in 4to. (with illuminated plates); and how many new species of zoophytes he discovered, we learn from another German work by Esper at Erlangen, the third volume of which is nearly finished.

METHOD OF PREPARING INKS THAT WILL WITHSTAND
THE ACTION OF THE OXYGENATED MURIATIC ACID. *By A. BOSSE, of Hamburgh.*

FOR illustrating the history of this subject, which has been fully treated of in the New Hanoverian Magazine, the following information may be necessary: Dr. Lentin, in his paper containing cautions in regard to the misapplication of the oxygenated muriatic acid, observed, that with the help of this acid our common ink could be obliterated without the least injury to the paper which had been written with it, if the paper were first drawn through diluted oxygenated muriatic acid; then through diluted sulphurous acid; and lastly, through water. At the same time he added some information which seemed to prove that this property had been employed in France several times to answer private purposes, and to the prejudice of others. Soon after appeared a paper by Philip Christian Pitel, of Minden, in which he recommended an ink, discovered by him, which was indestructible, and could be obliterated neither by the oxygenated muriatic acid, nor by any other corrosive substance. This induced M. Wehrs to examine this ink, and the same thing was undertaken by M. Gruner. According to their experiments, this ink, however, was obliterated in the course of nine hours by the oxygenated muriatic acid, and also by caustic pot-ash; but, at the same time, an opinion entirely opposite was announced by Dr. Lentin, M. Thorey, and M. Wiegleb, who all, in consequence of their having employed the same test, declared the ink to be indestructible. These different opinions are, therefore, directly contrary to each other. M. Gruner found that the ink could be destroyed by the oxygenated muriatic acid, and by caustic alkali: M. Thorey observed, that its blackness was only lessened by the oxygenated muriatic acid, and by the vapour of that acid. He found, however, as M. Gruner did, that the caustic alkali dissolved the ink entirely from the paper, but that, like several acids, it destroyed the paper. M. Lentin and Wiegleb deduced from their experiments, those of the former being made with oxygenated muriatic acid, and those of the latter with the same, as well as several other acids, and even caustic alkali, that this ink was entirely indestructible. These contradictory results M. Westrumb endeavoured to resolve in his examination of Pitel's indestructible ink, which he found to be only common ink mixed with indigo; and he proposed the following mixture for an ink which could not be destroyed:—Boil 1 oz. of Brazil wood and 3 ozs. of pulverised galls with 46 ozs. of water; strain the liquor, which must be boiled down to 32 ozs. and pour it, still warm, over 1½ oz. of perfectly pure sulphate of iron, 1¼ oz. of gum arabic, and ¾ oz. refined sugar. When these ingredients are dissolved, add from 1 to 1½ oz. good indigo, ground exceedingly fine, and ¾ oz. of purified lamp black.

It is well known that M. Pitel, of Minden, gave the first account of a kind of ink which withstood the oxygenated muriatic acid, at the desire of Dr. Lentin, who excited the attention of the public to various deceptions practised at Paris with common ink by means of the oxygenated

nated muriatic acid. As this ink consisted merely of a decoction of logwood and galls with water, in which sulphate of iron, gum arabic, and sugar, had been dissolved, and with which indigo and lamp black had been mixed mechanically, according to the analysis of M. Westrumb, it may be easily explained why it exhibited such different appearances when brought to the test. M. Gruner, apothecary in Hanover, was able to obliterate it entirely by the muriatic acid; while, on the other hand, its indestructibility by that acid is confirmed by M. Wiegand and Thorey. Both are in the right: as soon as the ink is well stirred round, it withstands this acid; but, if not stirred, this acid dissolves the black oxyd of iron, and the paper in the places wrote upon is restored to its pristine state. Now, though this ink, when stirred round, does not entirely fail of its object, this circumstance, however, may be often forgotten; and this the more readily, as even without stirring it has all the blackness when used of common ink, on account of the oxyd of iron which it contains. Since that time I have made experiments in order to produce an ink which might withstand the oxy-muriatic acid, and yet contain no iron. I have been able to accomplish this, as well as the composition of some other inks which contain iron, though it does not make their chief component parts, but serves only to give the ink a black colour. I made experiments also with the juice of green plants, according to the process by which M. Murray made an indestructible kind of ink from the same substances. Iron must not be the chief component part of an ink destined to withstand the muriatic acid, because, in the state of a black oxyd, it is easily dissolved by the acid. But as it acts on vegetable colours only when they are capable of taking up oxygen, and does not destroy them, but produces by its action a modification of the colour, they are exceedingly proper for this purpose. As none of these, however, were found entirely black, I was obliged to employ some mineral body which might be black and yet hold a great deal of oxygen. The most part of the metallic oxyds, of a black colour, contain very little oxygen, except that of manganese, which contains a great deal. I made choice, therefore, of this oxyd, and found, after repeated experiments, that it answered the intended purpose.

The oxy-muriatic acid dissolves all metals in a metallic form, as well as metallic calces, combined with a small quantity of oxygen, but not those which contain a great deal, as it has itself an excess of it. It is therefore capable,

1. Of dissolving metals in a metallic state, as the metals take up its superfluous oxygen, by which, as is well known, they become soluble in acids.

2. Such metallic oxyds as contain little oxygen are capable of abstracting it from acids, and they then dissolve in the acids, which then contain less oxygen.

The grounds which induced me to employ oxyd of manganese for preparing an ink capable of withstanding the oxy-muriatic acid, were as follows:—

1. Its black colour; 2. its containing a great quantity of oxygen, by which it is insoluble in the muriatic acid; 3. because it possesses so great an affinity for oxygen, that whenever it has lost any of its original quantity by being brought to a red heat, or exposed to the action of acids, it immediately draws it from the atmosphere, and again becomes black. I shall now describe the method of preparing this ink:—Boil

1 oz. of Brazil wood with 12 oz. of water for a quarter of an hour, add $\frac{1}{2}$ oz. of allum: evaporate the whole to 8 ozs. and mix with the liquor 1 oz. of exceedingly soft, finely pulverised, manganese, mixed up with $\frac{1}{2}$ oz. of pulverised gum arabic.

Brazil wood alone, by mere boiling, gives an ink not altogether unfit for use. Acids, less abundant in oxygen, such as the nitrous and muriatic acid, naturally exercise an action on this ink; but as these change the paper in a perceptible manner, deception is not to be apprehended.

Indigo also affords an ink that withstands the muriatic acid: it therefore makes a chief component part of that prepared by Pitel, but it is mixed in it only mechanically. The following is a prescription for preparing an ink of the like kind, but in which the indigo is actually dissolved:

Boil 1 oz. of Brazil wood, and 3 ozs. of coarsely pulverised galls, with 9 ozs. of vinegar and as much water, for the space of eight minutes; in the liquor, after being strained, dissolve $1\frac{1}{2}$ oz. of sulphat of iron and 1 oz. of gum arabic, and then add to the whole a solution of $\frac{1}{2}$ oz. of indigo in 1 oz. of concentrated sulphuric acid.

The oxy-muriatic acid dissolves the oxyd of iron in this ink, but the indigo remains undecomposed. The principal point to be attended to is, that the ink may contain such matters as are not affected by the oxy-muriatic acid: with other substances less deception is to be dreaded.

In the last place, I shall mention an ink made with the principal ingredients of common ink, but in preparing which, instead of the usual liquids, I employed the expressed juice of some plant: the fittest for this purpose I found to be the leaves of the caper spurge, *Euphorbia lathyris* Linn.; the common holly, *Sambucus niger*, and common grafts.

STATE OF GENOA.

GENOA is a republican state of Italy; bounded on the north by Piedmont, the Milanese, and the Parmesan; on the east by the states of the Duke of Tuscany; on the south by the Mediterranean Sea; and on the west by the county of Nice: it is about 120 miles in length, but scarcely in any part more than 20 in breadth. The country is mountainous, and part of it covered with barren rocks, which serve for its defence. Some of the mountains are covered with wood, and some yield good pasture. There is but a small quantity of arable land, so that the inhabitants are obliged to purchase great part of the corn from other countries; however, throughout the year they are supplied with excellent legumes and other vegetables for the table. They make a considerable quantity of wine, and have abundance of excellent fruit, especially citrons, oranges, pomegranates, almonds, and figs. A great number of mulberry-trees are raised to feed silk worms; and olives grow in great plenty, especially round the gulph of Spezzia. Salt is produced sufficient for exportation. The inhabitants are Roman catholics, and submit to the tribunal of the inquisition. The protestants, who dwell in the towns, are not beloved, but are suffered by the magistrates to dwell in peace. The manufactures are not so flourishing as they formerly were; the most considerable are velvet, plush, damask, different kinds of silk, gold and silver stuffs, lace, gloves, stockings, ribbons, soap, paper to imitate the Indian, &c. The manufactures are greatly reduced: too great a price being paid for the articles they manufacture, and the insecurity of their ports, contribute greatly to en-

feeble their commerce. The banking business in Genoa is very considerable, and the bankers are esteemed the richest in Europe. The city of Genoa was formerly the capital of Liguria. It was destroyed by the Carthaginians, and re-built by the Romans, whose ally it became, and whose fortunes it followed:

In the last century, the intestine dissensions about the form of government so debilitated the state, that the Genoese were obliged to put themselves sometimes under the protection of the Dukes of Milan, and sometimes under the Kings of France: but the latter treated them with intolerable haughtiness and rigour, till that naval hero, Andrew Doria, in 1528, rescued his country out of the hands of its tyrannical masters, settled it in perfect freedom, and established its present constitution. In 1684 it was cruelly bombarded by the French, and, to save itself from total destruction, was obliged to submit to very hard terms; two of which were, that the doge and four counsellors should appear in person at Versailles, and ask pardon; and that the state should disarm all galleys except six, with a promise not to fit out more without the knowledge and consent of the king. The ancient nobility consist of 28 families, and are those whom Andrew Doria, in 1528, separated from all the rest, and declared only capable of holding the chief offices, and dignity of doge; all the other inhabitants of Genoa being reduced by him to the class of commoners. Since that time it has been found necessary to create other nobility, who are allowed to keep manufactures of velvet, silk, and cloth; to farm the duties, and to have shares in merchant vessels; but all other business and handicrafts are forbidden. The form of government is aristocratic. The chief is called *doge*, or duke, to which dignity no person is promoted till he is fifty years of age, and has for fifteen years left off all trade or occupation not consistent with nobility. Every two years a new doge is chosen; and the former is incapacitated, during five years, to hold again the same post; however, he has a procurator's office assigned him, and a pension of 500 scudi for life. In times of peace, the republic usually keeps on foot a body of 5000 regular troops; besides these, it has also a militia, which, in case of necessity, is obliged to take the field. The cavalry it raises in time of war amounts only to about 600, who are of little service, by reason of the badness of the horses. The fleet of the republic, anciently so celebrated for its victories over the Saracens, Pisanese, Venetians, Spaniards, and Turks, and for continuing a considerable time masters of Sardinia, Malta, Majorca, Minorca, Candia, Cyprus, and many other places in and near the Mediterranean and Archipelago, and even the Black Sea, the Crimea, and other places, is now reduced to six galleys. The city is about ten miles in circumference, and defended towards the land by a double wall. Several bastions are erected along the sea-shore, on rocks which rise above the water. The streets are in general narrow, but clean and well paved; two are filled with magnificent palaces, fronted with marble. It is the see of an archbishop. The cathedral is built in the Gothic style, and paved with black and white marble; in the treasury of which is preserved a curious hexagon dish, said to be a single emerald, found at Cæsarea in the time of the crusades, which the Genoese received as their share of the plunder. Besides the cathedral, it contains thirty-two parish churches, many of which are magnificent, and adorned with sculptures and pictures by the best masters. The doge's palace is large, without decoration, except two statues of John Andrew Doria, and Andrew Doria,

Doria, larger than life, at the entrance. The arsenal contains arms for 34,000 men, machines, models for bridges, the armour worn by a number of Genoese women in the crusades, a shield containing 120 pistols, made by J. C. Vacche for the purpose of assassinating the doge and senate at one time, &c. They reckon at Genoa 69 convents of men and women, and the number of the inhabitants is estimated at 150,000.

Genoa surrendered to Vice-admiral Lord Keith and General d'Ott on the 4th of June. The garrison, 8110 men, are allowed to join the French army; the Austrian prisoners taken in the river of Genoa, during the present year, are to be given up by way of exchange.

THE BOCHETTA, a chain of mountains, situate in the state of Genoa, over which lies the great road from Lombardy to Genoa. On the peak of the highest mountain is a narrow pass, which will hardly admit three men to go abreast; and this pass, which is defended by three forts, is properly called the *Bochetta*, or little mouth. It is the key to Genoa.

SAVONA is the second town, for grandeur and opulence, in the state of Genoa. Its strength consists in two castles, but principally in a citadel, of much importance, (which surrendered to the Austrians on the 15th of May,) situated between the port and the city, upon an height, conveniently disposed to defend and protect both the one and the other.

NORTHERN LITERATURE, MAY, 1800.

AFTER an interruption of some time, the Royal Norwegian Society have again begun to publish their transactions, under the title of "Nveste Samling af det Kongelige Norske Videnskabers Selskabs Skrifter." This volume, besides a list of the members, and an account of Hammer's legacy for promoting the sciences in Norway, and the confirmation of his Danish majesty, contains various essays relating to the arts, manufactures, chemistry, natural history, mathematics, and philosophy. Among the papers are—On the Northern Rhubarb, and its use in dying; Experiments on Potash, in order to determine its purity; Description of a rare *Acridula*, by Dr. Ch. F. Hagerup; Anatomical Description of the Land Tortoise, by J. Rathke; Extract from a Meteorological Journal kept for ten years at Eger, &c.

Professor Thunberg, well known by his Voyage to Japan and his *Flora Japonica*, has undertaken a Natural History of the Swedish Animals. Part of this work has already appeared, and contains the first class of mammalia. The author, after explaining the properties of these animals in general, enumerates the different classes of them, according to his master Linnæus, and then gives an account of the seven orders, into which he divides the mammalia of Sweden. Those with webbed feet, among which he does not include the fish-otter, he makes a particular order, by which he unites the terrestrial animals with the whales. Then follows a description of fifty-eight Swedish species, according to the Linnæan definition, with the Swedish names. The author gives an account of the mode of life of these animals; their manner of feeding; the use they are of, or the hurt they occasion: the method of breeding those which are domesticated, and the manner of hunting those which are wild.

A second volume has been published of Biographical Anecdotes of eminent Swedes, both living and dead. This work is destined to pre-

serve the memory of men who have distinguished themselves in civil and military affairs, as well as in literature. The most complete life is that of Lieutenant-general Sinclair, which contains an account of his campaigns and military works, both printed and in manuscript; such as his translation of Kevenhuller's Military Maxims; his Military Institutions, in three volumes, printed at Deuxponts in 1773. Among his manuscripts, the most important is, the War of Seven Years in Hesse, Hanover, and on the Rhine, which forms seven volumes quarto.

The author of the above anecdotes has published also a selection of letters, forming part of his correspondence, for above half a century, with more than 150 literary men and others, Swedes as well as foreigners, together with some of their answers. They relate, in general, to literature and history; but in particular to those of Sweden.

The fourth part of the Transactions of the Royal Academy at Stockholm, for the year 1798, has been published. The contents are: 1. Observations on the Situation and Climate of the City of Umea, in West Bothnia. 2. Extract from a Meteorological Journal, kept at Umea during the last half of the year 1796. 3. Extract from a Journal of the like kind, kept at the same place, in 1797. 4. Mineralogical Observations on Gothland, by W. Helfinger, with a petrographic Chart. 5. Description of the *Gymnetrus Grilli*, lately discovered, and so called in honour of that great friend to natural history, A. U. Grill, by P. C. Lindroth. 6. *Dysphagia Chronica a bulimia orta*, by D. Haggström. 7. Description of the *Bucco Atro-flavus*, a new species of bird from Sierra Leona, by A. Sparrman. 8. Extract from a Meteorological Diary kept at the Observatory of Upsal, in 1798, by D. E. Holmquist.

A. D. Riegels has published, at Copenhagen, a small work, intitled, "*Philosophiæ animalium fasciculus Primus de Erinaceo*," &c. In the Introduction, the Author gives an Historical View of the Knowledge which the Ancients had of Zoology, and of the labours undertaken by them on that subject. He explains the principles established by Aristotle, and defends that author from some reproaches thrown out against him by Bacon. He then proceeds to a minute and ingenious description of the hedge-hog, and proposes to give a similar account of rats, the seal, the mole, frogs, and lizards, the swine, sheep, fowls, ducks, and geese, owls, crows, dogs, &c. He will point out the different uses of these animals.

A small work has appeared at Copenhagen, intitled, "*Förfog til en Skildring af Quindekjønnetts lauslige og borgerlige kaar hos Skandinaverne for Kristendommens indførelse*," by L. Engelstoft—An Essay towards a View of the State of the Female Sex among the Scandinavians before the Introduction of Christianity. This essay, which gained the prize proposed by the university of Copenhagen in the year 1796, is now given to the public with considerable alterations and additions. From this essay it appears that the Scandinavian women possessed very few and very limited rights: their domestic state, however, slavery excepted, was not only supportable, but, on the whole, comfortable.

The Society of Natural History at Copenhagen still continue their labours with zeal and diligence. The second part of the fourth volume of their Transactions has appeared, containing nineteen different articles, and illustrated with thirteen plates.

M. Kœhler, keeper of the cabinet of engraved stones belonging to the Emperor of Russia, has lately published at Petersburg the description of an amethyst in that cabinet, which formed part of the collection of the late Duke of Orleans, and was purchased by Catherine

II. This stone, which is one of most celebrated monuments of ancient art, exhibits a young man crowned with laurel, having his head covered with a transparent veil, which is folded back over the nose and the cheeks, envelopes the mouth and the lower part of the face, and is afterwards thrown over the shoulder. Baudelot de Dairval considered this head as that of Shame or Modesty; M. Galland supposed it to be that of a Roman emperor, or some divinity; the same Baudelot de Dairval afterwards wrote a large volume to prove that it was Ptolemy Auletes, and that three round points placed in the field indicated the three modes of music. Winckelmann, after refuting the conjectures of Baudelot, pretends that this amethyst represents Hercules in the service of Omphale, queen of Lydia, a country distinguished by the effeminacy of its inhabitants. Lachau and Le Blond, rejecting the explanation of Winckelmann, have ranked this stone among the number of those the heads of which are unknown. M. Kœhler, however, has explained this masterpiece of the glyptic art with considerable success by a little-known point of mythology, which is thus related by Plutarch: Hercules, returning from Troy with six vessels, was shipwrecked near the island of Cos, then inhabited by the Meropes. Having escaped with only one of his vessels, in which he saved his crew and their arms, he landed on the island, and meeting a flock of sheep, he asked a ram from the shepherd, named Antagoras. A violent tumult ensued; and Plutarch says, that Hercules, worn out with fatigue, and finding himself assailed by too great a number of adversaries, betook himself to flight, and retired to the house of a Thracian woman, where he remained concealed under a female dress. Having afterwards overcome the Meropes, and offered up an expiatory sacrifice, he married the daughter of Alcionus. Plutarch adds, that in remembrance of this exploit, a sacrifice was instituted in the island, in which the priest appeared in a female dress on the spot where the combat took place, and where newly-married women embraced their husbands, who, on that occasion, put on women's clothes. It is not Hercules, therefore, at the court of Omphale, but Hercules conqueror of the Meropes, who, according to M. Kœhler, is represented on this amethyst.

J. G. Lipsius has published a Description of the Gallery of Antiques, at Dresden, in a quarto volume of 526 pages, with 30 pages of tables, and ten plates. The origin of this gallery is as old as the reign of Augustus elector of Saxony, by whose order, medals, and other remains of antiquity, were purchased in 1560. Under his successors, this collection continued to increase, till by the munificent exertions of several sovereigns it became of the highest value and importance. Till the year 1785, the collection lay scattered in different pavilions of the large garden, where it was very ill arranged, and in such a state as to be of very little use to artists. The present elector, therefore, assigned a place for it in the Japanese Palace, and enriched it with several new and valuable acquisitions. M. Wacker, the inspector of this gallery, had made out a description of every thing it contains; but, as he died before it was published, M. Lipsius made use of his manuscript for the work here announced, and which will be of great utility to artists and amateurs, as the ten plates at the end of the volume exhibit plans on which the different articles are indicated by letters corresponding to the descriptions.

ACCOUNT OF THE IMPROVEMENTS MADE ON HIS MAJESTY'S FARMS IN THE GREAT PARK AT WINDSOR.
By NATHANIEL KENT, Esq.

[From the Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce.]

THERE having been some practices in husbandry, on his majesty's farms under my superintendence, in Windsor Great Park, which I conceive are not generally known, and being indulged with his majesty's gracious permission to state any matter that I may discretionally judge proper to communicate, I am induced to lay before the public a few particulars, which some gentlemen and farmers, under similar circumstances, may, perhaps, think deserving notice.

But, before I enter upon any particular description of what I have to offer, it will not, perhaps, be uninteresting to know the grounds upon which his majesty's last system of agriculture has been founded.

In the year 1791, the Great Park at Windsor, about 4000 acres, fell into his majesty's possession. It might truly be called a rough jewel. The whole, as a natural object, was grand and beautiful, of a forest appearance; but the parts were crowded and indistinct. The soil was various, some parts clay and loam, and some sharp gravel or poor sand; a great part of the former was covered with rushes and mole-hills, and the latter with fern and moss.

About 1000 acres of the lightest part were separated from the rest at one extremity, and formed what is called the Norfolk Farm; about 400 acres more, at the other extremity, of a good loamy soil, were separated, and called the Flemish Farm; both being named from the nature of the husbandry meant to be adopted upon them.

The rest (about 2400 acres) remains still in plantations and park; and, though so much reduced, yet, from the improvements which have been made upon it, is now capable of carrying more stock than the whole 4000 acres did before. All the unsound wet parts have been drained by the Essex mode, so as to be rendered firm and productive of an improved herbage. The mole-hills have been levelled, chiefly by dragging, and the coarse and mossy parts fined by repeated harrowing and rolling; (being one of the first improvements upon park land of this description;) besides which a variety of beauty has been laid open, by clearing the valleys and low parts, to give a bolder effect to the woody scenes upon the higher ground, and by making judicious openings, so as to break straight lines, and separate parts that were in some places too heavy and similar, so that the same extent of land has now not only a much larger appearance, but exhibits a much greater variety of ground. The truth of this, every impartial person who knew the place before his majesty caused these improvements to be made, must allow. I have only to add, that though prejudice may have taken up an idea, that there has been too great a sacrifice of timber in effecting these improvements, truth will deny it. There has not been a tree taken down, or removed, except on account of decay, or to give room for the growth of others, or to set them off to greater advantage in picturesque appearance.

I come now to the object in view, as before hinted, which is to state the motives which I am inclined to think induced his majesty to adopt the farming system upon so large a scale, and next, to shew the result.

These,

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These, I conceive, were chiefly to create useful labour for the industrious poor in the neighbourhood, and, by trying experiments in agriculture, to excite imitation where success might encourage it.

The Norfolk Farm borders on that extensive waste called Bagshot Heath, hitherto considered too barren for cultivation; though large tracts of a similar quality have been long since rendered useful to the community in the south-west part of Norfolk. Arable land, of this description, is generally managed there under a five-course shift; first, wheat; second, turnips; third, barley, with seeds, which continue laid two years. But, as the seeds turn to very little account after the first year, his majesty's, though a five-course shift likewise, of one hundred acres in a shift, is upon a much improved course of cropping; as thus:—first, wheat or rye; second, the irregular shift; third, turnips; fourth, barley or oats; fifth, clover. The irregular shift, which is of great use on a light farm, may, perhaps, want a little explanation. It is meant to be partly productive, and partly preparative. Forty acres of it are sown with vetches, to be fed off; forty are sown the latter end of August with rye, for early seed the next spring for the ewes and lambs; the remaining twenty acres are planted with potatoes, and the whole comes round for turnips the next year.

From the advantage of running sheep in the park, this farm has been brought surprisingly forward, considering the short time it has been cultivated; and a great part of it, which produced nothing but heath and moss, and would have been dear at five shillings an acre to rent, now produces more than the original fee-simple of the land.

Brevity checks me from going farther into a general description; but the following particulars may deserve notice.

The comparative advantages of the labour of the horses and oxen have been, for some time, under the consideration of the public. His majesty has unquestionably tried the latter upon a larger scale than any other person, as he does not work less than 180 oxen upon his different farms, parks, and gardens, and has found them to answer so well, that there is not now a horse kept. Upon the two farms and the Great Park, two hundred oxen are kept, including those coming on and going off. Forty are brought in every year, rising three years, and are kept as succession oxen in the park; one hundred and twenty are under work; and forty every year are fatted off, rising seven years.

The working oxen are mostly divided into teams of six; and one of the number is every day rested, so that no ox works more than five days out of the seven. This day of ease in every week, besides Sunday, is of great advantage to the animal, as he is found to do better with ordinary keep and moderate labour, than he would do with high keep and harder labour. In short, this is the first secret to learn concerning him; for an ox will not admit of being kept in condition like a horse, artificially, by proportionate food to proportionate labour.

These oxen are never allowed any corn, as it would prevent their fattening so kindly afterwards. Their food, in summer, is only a few vetches, by way of a bait, and the run of coarse meadows, or what are called leafows, being rough woody pastures. In winter they have nothing but cut food, consisting of two-thirds hay and one-third wheat straw; and the quantity they eat, in twenty-four hours, is about twenty-four pounds of hay, and twelve of straw; and, on the day of rest, they range as they like, in the straw-yards; for, it is to be observed, they are not confined to hot stables, but have open sheds, under which they

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eat their cut provender, and are generally left to their choice to go in and out. Under this management, as four oxen generally plough an acre a-day, and do other work in proportion, there can be no doubt their advantage is very great over horses, and the result to the public highly beneficial.

The oxen, which are brought on in succession, run the first summer in the park, and in the leasows and temporary straw-yards in the winter; by the term temporary straw-yards, I would have it understood that they are made in different places, so that the manure which they make may be as near to the spot where it is wanted as possible.

The forty oxen which go off are summered in the best pasture, and finished with turnips the ensuing winter. The usual way has been to draw the turnips, and to give them either stalled, or in cribs placed in the yard, with plenty of straw to browse and lie upon. But last winter an experiment was tried which answered extremely well, and will be again repeated next winter: this was penning the oxen by day upon the turnip-land, in the manner that sheep are penned, with this only difference, that the turnips were thrown up into cribs, instead of being left to be trodden into the ground; and in the night the oxen were driven into a yard with a temporary shed, well littered with rushes, fern, and leaves, and turnips and barley straw given them in cribs. They thrived very fast, and every one of them made, at least, eight loads of good muck in the night-yard, besides the benefit done in treading and dunging on the land in the day time, which was very great, the soil being very light. The result of the ox system is, that charging the ox for his agistment the first year for the value of the grass and turnips the last year, and putting what he has in three intermediate years as an equivalent for his labour, after every allowance for risk, each ox will pay, at least, twenty per cent. profit. In what instance does a horse produce so much?

I do not allow that the ox can be used on all soils; upon a very stony soil he cannot: nor can the horse, in all places, be wholly excluded from husbandry; but every occupier of a large farm may, at least, use some oxen to very great advantage. They are all worked at Windsor in collars, as their step is found to be much more free than when coupled together with yokes; and they are found to do their work with much greater ease in collars than in yokes, which ought every where to be exploded.

The different kinds of oxen are, in some measure, suited to the soil. Upon the Norfolk Farm, which is a light soil, the Devonshire sort are used: upon the Flemish Farm, where the soil is strong and heavy, the Herefordshire; and, in the park, where the business is carting, harrowing, and rolling, the Glamorganshire. They are all excellent in their different stations.

It may not be improper to mention a very simple method which has been discovered, of first training them to the collar: it is nothing more than putting a broad strap round their necks, and fastening one end of a cord to it, and the other to a large log of wood, and letting the ox draw it about as he feeds in his pasture, for three or four days before he is put into harness; by which means he is very much brought forward in docility.

I have before observed, that twenty per cent. may be considered as the average profit of an ox; stating them to be bought in at 10*l.* and allowing them to sell for 25*l.* taking off 10*l.* for the two years they are
not

not worked: but, last year, beans being of very little value, they were kept longer than usual, by being stall-fed with bean-meal, which answered very well, as they were brought to an average of nearly 30l. and one of them, a Glamorganshire ox, originally bought for 8l. (and, from his compact round make, always called the little ox,) thrived to such a surprising degree, that he became too fat to be able to travel to Smithfield, and was, therefore, sold to Mr. Charlwood, a neighbouring butcher, for 47l.

Next to the advantage obtained from oxen, as much benefit as possible has been endeavoured to be derived from sheep, by means of the fold. Two ewe flocks are kept, of four hundred each. The soil, being light and dry, admits of winter folding, (except when the weather is wet) upon the young clover; a practice much to be recommended, as it is productive of a great crop of clover, and prepares the land the ensuing autumn for a crop of wheat, without any farther assistance. Another excellent practice is, folding upon light land, in dry weather, immediately upon the sowing of the wheat, which may be put forward, or kept back, a fortnight or three weeks, on that account; and it is not amiss to have the fold rather large, and to give the sheep a turn of two round the fold in a morning, before they are let out, to tread and settle the land, which does a great deal of good, over and above their dung.

A third method of folding has been found to answer almost beyond description. This was first tried in the winter of 1793; but, from an idea of the shepherd, that it injured the sheep, has been since disused; but, as there is good reason to believe that there was no just ground for such an opinion, it is meant to be revived next winter.

A dry sheltered spot is selected, and sods of maiden earth, a foot deep, are laid over the space of a very large fold. It is then bedded thinly with rushes, leaves of trees, fern, moss, short straw, or stubble; and, in hard or wet weather, the flock, instead of being penned upon the clover in the open fields, is put into this warmer fold, where the usual quantity of hay is given to them in racks; every night they are so penned the fold is fresh littered. When this has been continued, at intervals, during the winter, a layer of lime, chalk, rubble, or ashes, six inches thick, is spread over the whole surface; and, when it has heated together, about the month of April the whole is turned up, and mixed together, and makes the very best manure that can be used for turnips.

I have been particular in describing these methods of folding, as they are not common in any place, and, in some, are entirely unknown; to gentlemen who have parks and large plantations, which afford abundance of leaves, this hint may be the more deserving attention.

Upon the Norfolk Farm, the land not having been yet marled or clayed, the clover is apt sometimes to fail; which is also the case elsewhere, upon the same sort of land. When this happens, his majesty does, what every other person, in a similar situation, should do; instead of letting the ground remain unproductive, the next year it is sowed with vetches, which are nearly as valuable as the clover, and wheat always grows remarkably well after them.

As to implements, the Norfolk plough is chiefly what is used; and, upon a light soil, it is certainly preferable to any other. It ploughs a cleaner furrow, by completely moving the whole body of earth, and inverts it much better than any other plough; and, to establish its superiority over the common ploughs of the neighbourhood, I need only add, that, from its construction, it is nearly the draught of an ox easier.

There is likewise a Norfolk harrow, very useful for harrowing what are called brush-turnips, or any other turnips, preparatory to their being hoed. I must be allowed, likewise, to mention the drill-roller, which consists of cast-iron rings, made at the Norwich foundry, and slipped on upon a round piece of wood as an axletree. This is one of the best things that has ever been introduced, for the preparation of the land for any sort of corn, where the soil will admit of its being used. By the corn being so well deposited, it takes better root; and, at least, one-fourth of the quantity usually sown may be saved.

The Flemish Farm, which I have before mentioned, was so named from an intention, at first, of carrying on a system of husbandry similar to that practised in Flanders, which consists of an alternate crop for man and beast; but, the soil being strong and cohesive, upon trial it has been found to answer best under a four-course shift, more like some parts of Gloucestershire, as thus: first year, wheat; second, cabbage or clover; third, oats; fourth, beans. The quantity of arable land on this farm is one hundred and sixty acres, or forty acres in a shift. There are two things observed upon this farm which may be worth notice: the first is, the practice which has for these two years past been adopted, of taking off the tops of the beans just as the blossom is set; this not only improves the quality, but increases the quantity, and causes them to ripen sooner, which is a considerable advantage, by giving time to get the succeeding crop of wheat in, perhaps a fortnight earlier. The other is, that of sowing clover early in the spring, among twenty acres of one-half of the wheat, and brush harrowing and rolling it in. This has produced a very fair crop of clover the next year; and the other half, after the wheat, is winter and spring-fallowed, and planted with cabbage. There is a double advantage resulting from this; that one-half of this shift, so managed, becomes a summer crop, and the other half a winter crop; and, by observing the next year to change the parts, by sowing the clover where the cabbage was before, the clover and cabbage do not come round upon the same ground except once in eight years.

Cabbage has been tried several years; but his majesty's husbandmen never got into the right management of it till this year; but the crop is now remarkably fine.

It will not be improper to mention, that the drum-headed cabbage is the best sort; that the seed should be sown in August; the plants first set out in November, and transplanted for good in July. The next thing to be noted is their application: they are certainly inferior to turnips for fatting, but superior in the increase of milk, either of cows or ewes, and, therefore, they are particularly good where there is a dairy, or a breeding flock of sheep. I trust his majesty will, the next yearling season, try an experiment of which I have high expectation, which is, to slice or quarter the cabbages, and feed the ewes with them, upon such of the meadows as want manuring; this, I flatter myself, will be of inestimable service to the ewes and lambs, and be the means of increasing the next year's crop of hay considerably.

The true light of viewing these improvements is, to consider them as a sort of new creation to the public: for, as it is a fact not to be controverted, that the reduced number of acres in the park, from their improved state, support as many deer and other cattle as the whole did before, the produce obtained from the farms is all clear gain. The crop of wheat and rye, from the one hundred and forty acres sown, upon the most moderate calculation, may be set at three thousand three hundred

dred and sixty bushels; and, allowing six bushels to a human mouth, this gives a yearly provision in bread for five hundred and sixty people; to say nothing of the fattening-off of forty oxen; the breed of eight hundred sheep; and the growth of, at least, five thousand bushels of oats and beans; all of which, it must be observed, goes in aid of the public market, as the work is done by oxen entirely.

OF THE TRADE-WINDS AND MONSOONS.

[Illustrated by an elegant Frontispiece to this Volume.]

THERE are many parts of the world where the winds, that with us are so uncertain, pay their stated visits. In some places, the winds are found to blow one way by day, another by night; in others, for one-half the year, they go in a direction contrary to their former course: but, what is more extraordinary, there are some places where the winds never change, but for ever blow the same way. This is particularly found to obtain between the tropics in the Atlantic ocean and great Pacific sea. Between the limits of 60 degrees, namely, from 30° of north latitude to 30° of south latitude, there is a constantly easterly wind throughout the year, blowing on the Atlantic and Pacific oceans; and this is called the *trade-wind*.

The trade-winds near the northern limits blow between the north and the east; and, near the southern limits, they blow between the south and the east. These general motions of the wind are disturbed on the continent, and near the coasts. Beyond the northern limit of the general wind, on the Atlantic ocean, the westerly winds prevail, but not with any certainty of continuance. In the Atlantic ocean, the S. E. trade-wind extends as far as three degrees north; and the N. E. trade-wind ceases at the fifth degree N. In the intermediate space are found calms with rain, and irregular uncertain squalls, attended with thunder and lightning: but this space is shifted farther to the northward or southward, according as the sun's declination is more northerly or southerly.

In the Indian ocean there are periodical winds, called *monsoons*, that is, such as blow six months in one direction, and the other six months in an opposite direction; the change of their direction, which is near the autumnal and vernal equinoxes, is always accompanied with violent storms of wind, thunder, and lightning.

On or near the coast of Guinea the winds blow almost always from the west and south-west points. Between the Cape Verd and the easternmost of the Cape Verd islands, there is a tract of sea, which is a perpetual calm with respect to wind; but the thunder and lightening there is terrible. The varieties and deviations both in general and particular winds are far from being known; we cannot, therefore, expect any theory that will solve them all; there are difficulties which perplex every hypothesis that has hitherto been suggested, and that cannot be cleared up at present.

The best account we have of the trade-winds is that of Mr. Dalton, namely, that as the heat is always greatest in the torrid zone, and decreases in proceeding northward and southward, with respect to these, the poles may be always considered as centers of cold; so that, abstracting from accidental circumstances, there must be a constant ascent of air over the torrid zone, which afterwards falls northward or southward, whilst the colder air below is determined by a constant impulse

towards the equator. In general, where the heat is greatest, the heated air will ascend, and a supply of colder air will be received from the neighbouring parts.

The following effects may be attributed to the diurnal motion of the earth; the air over any part thereof, when calm, will have the same rotatory velocity as that part; but if a quantity of air in the northern hemisphere receive an impulse in the direction of the meridian, either northward or southward, its rotatory velocity will be greater in the former, and less in the latter, case, than that of the air into which it moves; consequently, if it move northward, it will have a greater velocity eastward than the air, or surface of the earth over which it moves, and will, therefore, become a S. W. wind, or a wind between the south and the west; and, *vice versa*, if it move southward, it becomes a N. E. wind. Likewise, in the southern hemisphere it will appear, the winds, upon similar suppositions, will be N. W. and S. E. respectively.

From this view of the air, Mr. Dalton attempts to explain the trade-winds; he considers two general masses of air, as proceeding from both hemispheres towards the equator; these, as they advance, are constantly deflected more and more towards the east, on account of the earth's rotatory motion. That from the northern hemisphere, originally a north wind, is made to veer more and more towards the east; and, that from the southern hemisphere is made to veer from the south towards the east: these two masses, meeting in the torrid zone, their north and south velocities destroy each other, and they proceed, with their common velocity, from east to west, round the torrid zone. The equator is not the center of the concurrence, but the northern parallel of 4° , because the center of heat is at that place, the sun being longer on the north side of the equator than on the south side. Though all the parts of the atmosphere seem to conspire in producing regular winds round the torrid zone, yet, from the situation of the land, or other causes, striking irregularities are produced, as is evident from the monsoons, sea and land breezes, &c. these are deviations from the general rule, but this will ever be more or less the case with all human theories.

To explain the monsoons, it is necessary to attend to the circumstances that are peculiar to the Indian ocean, and which are not found in the Atlantic and Pacific oceans. They seem to be these: that the Indian ocean is bounded to the northward by shores, whose latitude does not exceed the limits of the general trade-wind; and that the general trade-wind falls, on what sailors term lee shores, to the westward.

The sun being twice a-year vertical in the equator, and never departing thence more than $23\frac{1}{2}$ degrees, causes the air in that climate to be hotter than at any other place in the ocean: such a rarefied space must extend across the Indian ocean, and produce a S. E. wind to the southward, and a N. E. wind to the northward; of the equator, over which, in the upper regions of the air, the winds return in the contrary direction. This we accordingly see happen in the months of October, November, December, January, February, and March. But when the sun declines to the northward, and heats the land there, the air contiguous to those lands is rarefied, and the lower air has a tendency to move that way: this tendency increases as the sun advances further north, so that the whole body of the lower air, to the northward of the equator, moves towards the northern lands, notwithstanding the equatorial rarefaction. It seems, then, that the body of the lower air in the northern part of the Indian ocean is determined, as to its course, by the greater rarefaction.

If the rarefaction, at the surface of the land, be greater than that at the equator, the wind blows to the north; and, the contrary happens when the equatorial rarefaction is the greatest. Thus it appears, that it is the situation of the lands, and their effect in heating and rarefying the atmosphere, which are the principal causes of the monsoons. Still, however, it must be owned, that the explanation is imperfect, and the observations we possess too few to form a theory. In the commencement of the monsoons, to use the seamen's phrase, they creep along the shore; they then spread into the ocean: at first they are feeble; they afterwards become violent and frightful; they then gradually diminish, and finally come to a change; and this twice in a year, agreeable to our solar progress.

The sun is the undoubted cause of the sea and land breezes, which are wisely appointed by Divine Providence to make some of the hotter climates habitable. The sea breezes in the West Indies begin to appear about nine o'clock in the morning, in a fine black curl upon the water, approaching the shore; it increases gradually till noon, and dies away at four or five in the afternoon. About six in the evening it changes to a land breeze, which blows from the land to the sea, and lasts till eight in the morning. There is an interval in the morning and evening, between the changing of the breezes, when the wind is stationary, like the water before turning of the tide; and these intervals are the hottest parts of the day.

The breezes are thus accounted for: when the sun is up, his heat takes more effect on the land than on the water, so that the heat is accumulated, and the air over the land is rarefied; and, as it mounts upward, the colder air from the sea comes in to keep up the equilibrium. In the evening the dews are so excessive, and the cold so sudden, on the land, from the quick descent of the sun below the horizon, that the water, in the night, is warmer than the land; and the air of the sea, being then most rarefied, the draught of air is contrary to what it was in the day.

In the northern temperate zone the winds are variable, but the most general are the S. W. and W. and the N. E. and E. In the northern temperate and frigid zones, the winds are more tempestuous in winter than in summer. In our climates, a tempest is but rarely known, and its ravages are registered as an uncommon calamity; but, in the countries that lie between the tropics, and for a good space beyond them, its visits are frequent, and its effects anticipated. In these regions the winds vary their terrors, sometimes involving all things in a suffocating heat; sometimes mixing all the elements of fire, air, water, earth, together; sometimes, with a momentary swiftness, passing over the face of the country, and destroying all things in their passage; and sometimes raising whole sandy deserts in one country, to deposit them in another. We have, therefore, very little reason to envy those climates the luxuriance of their soil, or the brightness of their skies. Our own cloudy atmosphere, that wraps us round in obscurity, though it fails to gild our prospects with sunshine, or our groves with fruitage, nevertheless answers the calls of industry; the labourer toils in the certain expectation of a moderate but happy return.

The rains in the West Indies are by no means the things they are with us. Our heaviest rains are but dews comparatively: they are rather floods of water, poured from the clouds with a prodigious impetuosity; the rivers rise in a moment; new rivers and lakes are formed;
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and, in a short time, all the low countries are under water. It is in the rainy season, principally in the month of August, that they are assailed by hurricanes, which destroy, at a stroke, the labours of many years, and prostrate the most exalted hopes of the planter, and that often when he thinks himself out of the reach of fortune. It is a sudden and violent storm of wind, rain, thunder, and lightning, attended with a furious swelling of the seas, and sometimes with an earthquake; in short, with every circumstance, which the elements can assemble, that is terrible and destructive. First they see, as a prelude to the ensuing havock, whole fields of sugar-canes whirled into the air, and scattered over the face of the country. The strongest trees of the forest are torn up by the roots, and driven about like stubble; their wind-mills are swept away in a moment; their works, the fixtures, the ponderous copper-boilers and stills, of several hundred weight, are wrenched from the ground, and battered to pieces; their houses are no protection; their roofs are torn off at one blast, whilst the rain, which, in an hour, rises five feet, rushes in upon them with irresistible violence.

There are signs by which the Indians of these islands taught our planters to prognosticate the approach of an hurricane. The hurricane comes on either in the quarter or at the full change of the moon. If it comes on at the full, then at the preceding change the sky is troubled, the sun more red than usual; there is a dead calm below, and the mountain tops are free from those mists which usually hover about them. In the caverns of the earth, and in wells, you hear a hollow rumbling sound, like the rushing of a great wind. At night the stars seem much larger than usual, and surrounded with a sort of burs; the north-west sky has a black and menacing appearance; the sea emits a strong smell, and rises into vast waves, often without any wind. The wind itself now forsakes its usual steady easterly stream, and shifts about to the west, from whence it sometimes, with intermissions, blows violently and irregularly about two hours at a time. They have the same signs at the full moon; the moon herself is surrounded with a great bur, and sometimes the sun has the same appearance.

The nature of the soil, over which the wind blows, has a great effect upon the quality of the air: the vast sandy deserts of Africa and Arabia give a burning heat and blasting quality to the air that passes over them. These horrid regions lie to the southward and eastward of the Mediterranean; and hence it is that travellers, who have had the opportunity of making the comparison, tell us, that the air of the West-India islands is nothing to the hot suffocating winds which blow in the night at Minorca and Gibraltar, for these latter are scarcely supportable by the human frame. At Goree, in the river Senegal, there is an easterly wind from the inland parts, with which those who are suddenly met by it in the face are scorched up as by a blast from a furnace.

An extraordinary blasting wind is felt occasionally at Falkland Islands. Happily its duration is short; it seldom continues above twenty-four hours. It cuts the herbage down as if fires had been made under them; the leaves are parched up, and crumble into dust; fowls are seized with cramps, so as never to recover; men are oppressed with a stopped perspiration, heaviness at the breast, and sore throat, but recover with care.

But, beyond all others, in its dreadful effects, is the *famiel*, or mortifying wind, of the deserts near Bagdad. The camels, either by instinct or experience, have notice of its approach, and are so well aware of it, that they are said to make an unusual noise, and cover up their noses in
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the sand. To escape its effects, travellers throw themselves as close as possible to the ground, and wait till it has passed by, which is commonly in a few minutes. As soon as they who have life dare to rise again, they examine how it fares with their companions, by plucking at their arms or legs; for, if they are destroyed by the wind, their limbs are absolutely mortified, and will come asunder. It is said of this wind, that if it happens to meet with a shower of rain in its course, and blows across it, it is at once deprived of its noxious quality, and becomes mild and innocent. It is also said, that it was never known to pass the walls of a city.

The following picture of the setting in of the monsoons is given by Dr. Mosely, and will readily account for the necessity of Lord Cornwallis's hasty return to Bangalore, on the failure of his first attempt upon Seringapatam. "The ruin and desolation accompanying these hurricanes, says Dr. Mosely, cannot be described. Like fire, its resistless force consumes every thing in its track, in the most terrible and rapid manner. It is generally preceded by an awful stillness of the elements, and a closeness and mistiness in the atmosphere, which makes the sun appear red, and the stars large. But a dreadful reverse succeeds—the sky is suddenly overcast and wild—the sea rises at once from a profound calm into mountains—the wind rages and roars like the noise of cannon—the rain descends in deluges—a dismal obscurity envelopes the earth with darkness—the superior regions appear rent with lightning and thunder—the earth often does, and always seems, to tremble—terror and consternation distract all nature—birds are carried from the woods into the ocean—and those whose element is the sea seek for refuge on land—the frightened animals in the field assemble together, and are almost suffocated by the impetuosity of the wind in searching for shelter; which, when found, serves them only for destruction—the roofs of houses are carried to vast distances from the walls, which are beat to the ground, burying their inhabitants under them—large trees are torn up by the roots, and huge branches shivered off, and driven through the air in every direction; with immense velocity—every tree and shrub, that withstands the shock, is stripped of its boughs and foliage—plants and grass are laid flat on the earth—luxuriant spring is changed, in a moment, to dreary winter.—This direful tragedy ended, when it happens in a town, the devastation is surveyed with accumulated horror: the harbour is covered with wrecks of boats and vessels; and the shore has not a vestige of its former state remaining. Mounds of rubbish and rafters in one place, heaps of earth and trunks of trees in another, deep gullies from torrents of water, and the dead and dying bodies of men, women, and children, half buried, and scattered about, where streets but a few hours before were, present the miserable survivors with a shocking conclusion of a spectacle to be followed by famine, and, when accompanied by an earthquake, by mortal diseases."

DESCRIPTION OF THE ISLAND OF CELEBES OR MACASSAR.

THE island of Celebes, called also Macassar, is of great importance to the Dutch for the spice trade, on account of its situation, as it has, on the north, the Philippines; on the west, the Sunda isles; on the east, the Moluccas; and, on the south, Timor and Java. It extends from the third degree of north to the fifth of south latitude, and lies nearly under the 136th degree of longitude. It is about a hundred

hundred and twenty miles in length from north to south; and forty-five in breadth from east to west. Raynal says, its diameter amounts to about a hundred and thirty miles; by which, in all probability, he understood its length from north to south. Properly, the eastern side of the island is called Celebes, and the western Macassar; but, in general, the former name is given to the whole island, particularly by the Dutch.

As this island lies under the line, the air is exceedingly hot; but the heat is moderated by frequent rains and cooling breezes; and, in most places, the air is not prejudicial to the health of the inhabitants. It abounds with mountains, but the soil, taken in general, is fertile. Rice, cocoa-nut-trees, mangoes, bananas, melons, and oranges, grow here exceedingly well, and are cultivated in abundance, together with the cotton-shrub, *uba*, and *batta*. There are here also plenty of horses, oxen, buffaloes, deer, wild swine, and birds of all kinds, and, in particular, a variety of beautiful parrots. Abundance of fish are caught on the sea-coasts, as well as in the rivers and lakes.

The Dutch carry hither opium, spirits, lack, coarse and fine cloths, &c. and receive, in exchange, rice, wax, slaves, and gold. Here, as well as in many parts on the coast of Africa, the unfortunate beings doomed to slavery are not prisoners taken in war, or criminals, but people, in general, who have been kidnapped, for the purpose of being sold; and it often happens, that relations do not hesitate, for the sake of gain, to deprive their fellow-creatures of liberty, the greatest blessing which mankind enjoy in the present life. The island is well peopled: on the coast of Celebes alone, there are said to be fifty-six thousand inhabitants, seventeen thousand of whom are capable of bearing arms.

In this island there is a multitude of small kingdoms and states, the greater part of which, however, depend on the two great kingdoms of Macassar and Bony. The king of Ternate, also, has extensive possessions, which occupy almost the whole of the northern and eastern part of Celebes. The two most powerful kings, whom the Dutch, by the preponderance of their arms, obtained as allies, are the kings of Macassar and Bony. The kings of Tello and Sandrabony are in alliance with the king of Macassar; and those of Soping, Luhu, and Tannette, with that of Bony. Some small states, such as Wadjo, Mandhaar, &c. are independent. Though the kings of Macassar and Bony are allies of the Dutch, they are always sworn enemies to each other; and this is not unfavourable to the policy of the Dutch, who, in their Indian possessions, still keep in view the maxim *divide et impera*, and who derive great advantage from the discord of the eastern princes.

The kingdom of Macassar or Goath lies on the western side of the island, of which it occupies the greater part. The king of Goath, and that of Tello, both bear the title of Macassar, though each has a distinct kingdom: they assume the title of Goath and Tello from their places of residence. According to an ancient tradition, the Macassars, like many other nations, deduce the origin of their princes immediately from the gods. Once, they say, after the death of the first sovereign of the kingdom, a beautiful female descended from heaven, suspended by a gold chain. This celestial beauty, named Tumanurong-a, was immediately chosen by the Macassars to be their queen. She afterwards married a king of Bonthain, and, after being pregnant three years, brought forth a wonderful child, capable of speaking and walk-
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ing as soon as it was born, but exceeding ugly and deformed. This young prince was named Tuma-Salingabeerang. When he attained to manhood, he broke the golden chain, which his mother had brought with her from heaven, and the mother and her husband instantly disappeared, and left to their son the kingdom, together with one-half of the chain. This chain, which, it is asserted, was sometimes light, and sometimes heavy, and sometimes appeared of a pale colour, was long preserved, as a valuable part of the regalia of the crown; until it was lost, with various other rarities, during the warlike commotions which took place in this kingdom about the middle of the present century. This Tuma-Salingabeerang is considered as the chief of the family of all the kings of Goach.

The Dutch were involved in violent disputes with these sovereigns before they were able to establish themselves in their kingdom. In the year 1778, Goach, the capital, was taken by storm, and destroyed; and, in 1781, the present king, Punduca Siri, sultan Abdal Hadja, was placed on the throne by the government of Batavia. The king of Goach does not enjoy unlimited power, but is subject to certain laws, which he is obliged strictly to observe. He can undertake no measure of importance without the consent of his council, nor can he inflict arbitrary punishment on criminals, who must be punished according to the laws. He has a privy-council called *tonulalangs*, and every village is under the direction of a particular governor, distinguished by the title of *galarang*.

The Portuguese visited this island about the beginning of the sixteenth century, and obtained from the sovereign then on the throne permission to form an establishment. The successors of this prince introduced the weights and measures now in use, fixed the prices of merchandize, manufactured gunpowder, and planted the first cannon on the walls of Goach. He gave permission also to the Malays not only to reside in his kingdom, but to erect a Mahometan temple. This religion made such progress here, that, about the year 1588, deputies were sent to Mecca, to bring from thence a hadja, or priest, to instruct the Macassars in the doctrine of Mahometanism, which, in 1603, was established throughout the whole kingdom under the sultan Allahudier.

The kingdom of Bony, which lies on the western side of a bay, called, on that account, the Bay of Bony, is the second kingdom, in point of importance, in the island. It is in close alliance with the two small kingdoms of Soping and Luhu. The natives of Bony, that they may not appear inferior to the Macassars, deduce their origin, in the like manner, from the gods. The first king, they say, descended from heaven, and was known by the name of Matta-Solompo-e, that is, the all-seeing. This sovereign, after reigning forty years, resigned the kingdom to his son, and, with his wife, ascended again to heaven; but, notwithstanding this common descent of their rulers from the race of the gods, the Macassars and people of Bony are sworn enemies, and their incessant quarrels greatly contributed to enable the Dutch, who, according as their interest required, favoured sometimes the one party, and sometimes the other, to make themselves masters of the island. At present, the Bouginese, or people of Bony, are the most powerful, as the Macassars were about a century ago.

The Bouginese are of a middle stature, and have a brown complexion, but not dark. Among the female sex, in particular, some are found almost entirely fair. Their features, in general, are agreeable, only that

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that the nose is a little flattened. The Macassars, on the other hand, are of a large stature, have a manly warlike appearance, are of a more open disposition, and, at the same time, detest treachery; while their opponents, the Bouginese, never attack openly, but endeavour to fall upon their enemies by surprise. Those even who never did them an injury are not secure from being murdered by them when they can do it with privacy; and they often commit such actions for no other reason, as they say, than to try the goodness of their daggers. Many Macassars, as well as Europeans, have fallen a sacrifice to this thirst for blood. Their daggers and assagays are, for the most part, poisoned, as well as their small darts, which they can shoot at their enemies to a considerable distance by blowing them through a tube.

Their clothing consists of a piece of blue or red cotton cloth wrapped round the body, and drawn through between the legs. The upper part of the body is quite naked. On the head they wear a piece of cotton-cloth in the form of a handkerchief, with which they cover their hair, which is as black as pitch, and exceedingly long. On the other parts of the body, neither the men nor the women suffer any hair to grow; they pull it out by the roots, in the same manner as the Mahometans and Indians, as soon as it appears. They feed, for the most part, on rice, fish, and pisangs; and their beverage is water, though they are not destitute of *sagueer*, or palm-wine. The Bouginese women are, in general, much handsomer than those of the other Indian tribes: some of them, had their complexion the same mixture of red and white as our females, would be accounted beauties in Europe. They are naturally of an amorous disposition, and are capable of undertaking any thing to gratify their inclinations.

The Mahometan religion, which has here become general, permits the Bouginese to have four lawful wives, provided the husband can maintain them. If the parties, however, are not satisfied with each other, they may separate with as little trouble as they were united. Their funerals are attended with very little ceremony. The body is wrapped up in a piece of white cotton cloth, and deposited in the grave, over which some sweet-scented flowers are strewed, and two stones are erected, one at the head, and another at the feet. The Bouginese have a sort of game at cards, which, in all probability, they learned from the Portuguese. It has a great similarity to that called *tarocco*, though the twenty-two tarocks are not among their cards. The four colours are called *spada*, *datudyens caso stokke*, *copas-couset*, and *boelang-rosy*.

As the Dutch readily saw the importance of this island, particularly in regard to their spice trade, they did every thing in their power to form a settlement in it, and even at an annual expence, which considerably exceeded the income arising from their trade: the abbé Raynal makes it to be 165,000 livres. The castle of Rotterdam, which is the principal residence of their East-India company in the kingdom of Macassar, lies in the latitude of 5° 7' south, and the longitude of 136° 50'. It was constructed by the Portuguese, with the assistance of the Macassars, and was afterwards beautified by the Dutch, who increased its fortifications. Some years ago, a neat church was erected here, capable of containing two hundred persons. The walls of the fortrefs, which are strong, and of considerable height, are built entirely of stone hewn from the rock. On coming out by the land-gate, you arrive at a large plain, on the north side of which lies the village of Blaardingen, where the principal part of the Europeans reside. The streets,

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streets, which are broad, and ornamented with beautiful buildings, intersect each other, at right angles, in the direction of the four points of the compass. At the end of one of them is a large edifice, set apart for an orphan-house. The Chinese all live together in one street, called, for that reason, the Chinese-street. Blaardingen is surrounded with palisades, and is furnished with gates, which are shut in the night-time. Without the palisades, towards the south, there is a row of buildings, one of which is the habitation of the governor, and, at a little distance, there are some places called *campongs*, inhabited by natives and Europeans.

The road of Macassar is one of the most beautiful in India, and, at the same time, safe for ships at every season of the year. The district around it is exceedingly pleasant. It consists of a large plain, several miles in extent, in which, as far as the eye can reach, nothing is to be seen but rice-fields and meadows, watered by small streams. The picturesque appearance of this scene is heightened by groves and scattered clumps of shady trees, loaded with fruit. Towards the east, it is bounded by lofty mountains, called the mountains of Bonthain, which divide this part of Celebes, towards the west, from Bony, and, towards the south, from the gulph of Tomini, into two parts.

The seasons are here the same as in Java. The south-east monsoon continues from May till November, and is called the favourable monsoon: the north-west, called the bad monsoon, continues from November till May. During the former, the sky is serene, and the weather dry; but continual winds and violent rain prevail during the latter. It is very singular, that, on the east side of the before-mentioned mountains of Bonthain, the contrary takes place: for, when fine weather in the south-east monsoon prevails on the west side of the mountains, there is nothing but hurricanes and rain on the east side; so that the boundaries of summer and winter are only a few miles distant from each other. The principal productions here are rice and cotton. The rice, however, is inferior in quality to that of Java, but the cotton is the best in India.

The Dutch East-India company possess the castle of Rotterdam, called in the language of the country Adjong Pandang, together with the surrounding district, in consequence of a treaty which they entered into with the prince of Celebes. But, as the boundaries of their possessions were, perhaps, not accurately defined, the company always endeavoured to enlarge, and the Macassars, on the other hand, to confine, them. The company possess also a peninsula, extending from this place towards the north, and a large flat district, which, on account of its fertility, is considered as the granary of Celebes, together with several places lying between this plain and the mountains, and likewise a great many villages among the mountains. These places border on each other, and are bounded on the west by the sea, on the north by the kingdoms of Tanette and Maros, on the east by Tamari, and on the south by the kingdom of Macassar. The inhabitants of them, after various revolts, were, at last, reduced to complete obedience in 1738.

I shall omit saying any thing of the other small kingdoms in the island of Celebes, and proceed to a description of its gold mines, and the method in which the gold is collected. Mining and the art of metallurgy are conducted in a very careless manner in India; which is owing partly to the ignorance of the natives, and partly to their indolence.

lence. In general, it needs excite little surprise that people, who live in a mild climate, and who have few wants, should be little inclined to penetrate into the bowels of the earth to procure metals, which are immediately extorted from them by the avaricious Europeans, or of which they are, in a great measure, deprived by their own princes. If an Indian here and there be compelled by force or necessity to dig for or collect gold, he never goes to work with sufficient intelligence and activity, but contents himself with what he can procure to satisfy his wants in the easiest and speediest manner. This is exactly the case with the Indians who inhabit those parts of Celebes which produce gold.

They obtain that metal by collecting the small particles which have been carried down by the streams, or by washing the sand which they dig up, rather than by working the mines in a regular manner. The auriferous mines in the island of Celebes commence on the southern side of Bulang, and the northern side of Kotta-Buna, or Mogondo, and proceed thence to Dondo on the south-west, and Tamperana on the north-west side, at the Bay of Tomini. Every where between these two districts gold is found in a greater or less quantity. Where the land of Celebes becomes so narrow, and the mountains so low, that a person can with ease pass from the one coast to the other in a few hours, the auriferous mountains end; and on the whole coast on the other side, as far as Macassar, a single gold mine is not to be found.

Besides the mines already discovered, a great many others would, no doubt, be found, were there a sufficiency of labourers; for the villages in these auriferous mountains are exceedingly ill-peopled. Another cause of these treasures being so much neglected is the ignorant superstition of the natives. They never will venture to dig in any place where they suspect great riches to be concealed, until they have sent thither a diviner, as he is called, to find out whether their labours will be attended with success. The whole art of these diviners, called in the language of the country *talanga*, consists in their discovering, as they pretend, by the voice of a certain bird, whether abundance of gold is to be found in a certain place; whether the labourers will be attacked by sickness; whether there are in it many spirits to impede the labourers, and conceal the gold from them, with other things of the like kind. If the bird gives a favourable answer to all these questions, the diviner must endeavour to secure the favour of the protecting spirits of the place by offerings of various kinds; after which a few workmen may begin digging, and continue their labour as many days or months as the bird has prescribed. If the bird, however, gives an unfavourable answer to only one question, no person will venture, in such a place, to dig a hole of only a few inches in depth. Many rich mines remain, therefore, unexplored, because the prophetic bird, or the *talanga*, is not in good humour.

When the workmen have arrived at the place where, according to the permission of the *taranga*, they may dig up gold, they hold serious counsel with the bird once more, and ask it in what particular spot they must begin. When this is done, they first conduct water to the spot; for, without water, they cannot proceed, as, by its means, they wash away the earth and clay from the pit, that the stones and fine sand, among which the gold is contained, may remain pure. If the situation of the ground will not admit of the water being conducted in furrows, they make a kind of gutters of hollow *wakta*-trees, which they

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they support with props. When they have brought the water to the place where the mine is to be worked, they make a pit of twenty, thirty, or forty, feet in circumference, according to the number of workmen; sometimes there are eight, and sometimes ten or twelve. As long as the water has room to run off, they suffer it to carry with it the earth, which they keep continually turning and stirring in the pit; but, when the pit becomes so deep that there is no passage for the water, they must bale it out till they arrive at the stones. These they wash clean, and build them up regularly around the sides of the pit, but without lime or mortar, to prevent the earth from falling in. When the pit is carried to a very great depth, they secure these stones by means of boards and beams of wood. These poor miners find sometimes stones of from three to four and five hundred weight, which they are obliged to raise and remove from the pit without any other machines than a common wooden lever.

When all the earth, clay, dirt, and stones, have been thrown from the pit, and a kind of black sand begins to appear, they are then sure that they shall find gold. This sand they take up in a kind of small shovels made for the purpose; and, having placed themselves in the water, they put one handful of the sand after another on small round wooden dishes named *dulang*s. These *dulang*s are about eighteen inches in diameter, and somewhat hollow, and have a small cavity in the middle, which can be closed with a wooden cover. When all the sand has been washed from the *dulang*, by being continually stirred round with the hand, the gold, which is much heavier, remains in the above-mentioned cavity. When it can receive no more, they take the gold which has been collected, and hold it over the fire in a cocoa-nut-shell till it is dry; after which they blow away the remaining sand as well as they can, and preserve the pure gold.

When they dig a hill or mountain which is situated close to a river, they employ another method to obtain the gold. In this case, they make a pit at the edge of the river, conduct into it as much water as they have occasion for, throw into it the earth they have dug up, and wash it till nothing remains but the black sand mixed with gold; after which they wash it in their *dulang*s, as already described. This is the easiest method of procuring gold, provided it can be employed. They have, however, a third method; but it can be used only in mines newly discovered. They go into the river, with a basket on their back, and a piece of iron resembling a thick chisel, which has a wooden handle, and search the fissures and crevices of the rocks, where they sometimes find lumps of gold equal, in weight, to two or three rials. In other respects, the art of digging for gold is the same in all the mines, and among all the people, on this coast. The only difference is in regard to the depth of the pits. In many places, it is scarcely necessary to go deeper than ten or twelve feet; but, in others, the pits must be carried to the depth of several fathoms, and the sides must be supported by means of boards and beams. The instruments used in these mines consist only of a piece of iron about a foot and a half long, and two inches in thickness: it is pointed and sharp at the one extremity, and, at the other, is furnished with a socket, into which is stuck a wooden pole about six feet in length. Those who are able to procure it, have also an iron hook, with a short wooden handle, which they employ for loosening and turning up the earth around the stones. A mattock, with the above-mentioned *dulang*s, which each miner makes

makes for himself, and a pair of gold-scales, form all the rest of their apparatus.

When a gold mine is discovered, the workmen do not immediately begin to dig it, but first search the nearest river, in which they turn up the stones, and drain off a part of the water. After they have turned up the sand, to about the depth of a foot, they sometimes find large pieces of gold, which, in all probability, have been washed down by the streams from the mountains. It has been remarked, that the rocks on the borders of rivers, and even the greater part of the stones which are taken up from pits where the ore is rich, have a blue, and sometimes yellow, colour, and are so soft that they may be used as paint. Where the gold is less rich, the stones are grey or white, and either of a hard texture, or soft like limestone. By these signs, the produce in gold of any mine may be easily ascertained.

In all the gold mines, but particularly those which lie at a distance from the shore, it is exceedingly cold before sun-rise, and after sun-set. On this account, the poor miners suffer a great deal. As they are obliged to sit in the water from morning to night, their bodies, when they cease from their labour, are almost rendered quite white by the saltpetre. When the mines are worked, the water of the river near which they are situated, is muddy, and of a reddish-yellow colour, down to its mouth; and those who are so imprudent as to drink of it are seized with a dangerous dysentery.

The labour of the miners is not always attended with the same success; for it sometimes happens, that they work a month and longer, during which they spend several dollars, without finding gold of the value of one. In that case, they are obliged to dig in some other place, and to renew their labour. In newly-discovered mines, they are, for the most part, successful; but, in mines that have been worked for some time, they are often obliged to labour a whole month before they can obtain any gold. The quantity and value of the gold which is found in any mine cannot be accurately ascertained. One workman, also, is often more fortunate than another. In newly-discovered mines, there are labourers who, sometimes, in the course of fourteen days, find to the value of two hundred dollars; whereas, in other places, the value of twenty dollars is scarcely found in the course of a year.

In the wide-extended gold mines of the river Palella, which divides itself into several branches, there are places where gold is exceedingly abundant; but in such places it is of less value, being scarcely eighteen carats fine. The best gold comes from the mines of Popajatu, Molisipat, Ankahulu, Telodinki, Lembuno, Sonfio, and Tamperana; also from the south and south-west side of Pogiana, Wongo, Tomellas Bevol, and Tontoly. The gold procured from all these mines is, for the most part, above twenty carats fine. Frederick Dühr, a servant of the Dutch East-India company, who visited these mines a few years ago, is the only person who has given an authentic account of them. Those who travelled through these districts before him, never saw the gold mines, but only visited the habitations of the chief civil-officers, which are at a considerable distance from the places where the gold is dug; and the chief men among the natives are too indolent to undertake journeys along those difficult and dangerous roads which conduct to the mines, and in which people are often in danger of breaking their necks.

Within the extent of the gold mines of Ankahulu, there is a place called

called Longi, which produces a kind of gold that, in fineness, exceeds even that of Popajatu and Ankahulu. This place, however, is little frequented, because the small river, near which it is situated, is not navigable, and the inhabitants are obliged to carry their provisions on their backs along a difficult and dangerous road. Besides, the miners often find, in this place, a great deal of copper, which, when they have no acid to put it to the test, often deceives them, as they, at first, take it to be gold. This is the only mine on the north or north-west side where copper is found. Near Bevool, on the south or south-west side, there is another where good copper is dug up in dust, which is as fine as the finest gold-dust. In the mines of Bombula, Batodulang, Ankahulu, and Palella, a great deal of rock-crystal is found, and likewise a kind of iron ore.

In almost all the mines which the before-mentioned Mr. Dühr visited, he observed, that the workmen, when they had dug to the depth of five, and, in some places, of twelve, feet, came to a horizontal stratum of rock, which, with their instruments, they were not able to penetrate. They, however, frequently told him, that they firmly believed that they should find gold below these rocks, if they could break through them. He saw, also, at Ankahulu, where a stratum of such rock is found, at the depth of from twelve to fifteen feet, that there were fissures in it, two or three inches wide, which contained a blackish substance, almost like rust of iron, mixed with a great many pieces of gold, and which the workmen, after they washed the rock perfectly clean, dug out, to as great a depth as they could, with their tools. In all the mines of Celebes, the gold, when separated from the sand, is of considerable fineness. At Pogjama and Palella alone, gold ore is found, here and there, mixed among other stones; but it is not rich; and the gold must be extracted by pounding the stone, which is not very hard.

PREPARATION OF WRITING-INK.

HAVING been brought up in a line of business in which I am in the daily habit of observing the action of such substances upon each other as enter into the formation of ink, it may readily be imagined, that, in a practical point of view, my opportunities for the improvement of it have fallen little short of any individual whatever. If to this I add, that, since the year 1794, I have annually supplied the public with, at least, 17,000 gallons of ink, besides preparing powder for its occasional production, it may be inferred, that I have spared no pains in studying what would best conduce to its perfectability; and after the many attempts which I have made, I have never found my expectation, or that of my friends, deceived, when the process has been conducted agreeably to the following directions:—In six quarts (beer measure) of water, (it does not appear of importance whether it be rain, river, or spring, water,) boil four ounces of the best Campeachy logwood, chipped very thin across the grain; (the boiling may be continued for near an hour;) adding, from time to time, a little boiling water, to compensate for waste by evaporation: strain the liquor whilst hot, suffer it to cool, and make up the quantity equal to five quarts by the further addition of cold water. To this cold decoction put one pound, avoirdupois weight, of blue galls, or 20 ozs. of the best galls in sorts, which should be first coarsely bruised; 4 ozs. of sulphat of iron, calcined

calcined to whiteness; $\frac{1}{2}$ oz. of the acetite of copper, which should be triturated in a mortar, moistened by a little of the decoction, gradually added, till it be brought to the form of a smooth paste, and then thoroughly intermixed with the whole mass. Three ounces of coarse brown sugar, and six ounces of good gum Senegal, or Arabic, are also to be added. These several ingredients may be introduced, one after the other, immediately, contrary to the advice of some, who recommend the gum, &c. to be added when the ink is nearly made; as gum, however, is, at present, exorbitantly dear, three or four ounces will be found sufficient, with only one and an half ounce of sugar, unless, for particular purposes, it is wanted to bear a higher gloss than common. In regard to the use of sugar, which I have here recommended, I hope I shall not trespass in remarking, that my observations, on a very extensive scale, are coincident with those of M. Ribancourt, who says, that a degree of fluidity is, by its means, imparted, which allows the dose of gum to be enlarged considerably beyond what it would bear without it; and it is thereby rendered less liable to clog the pen, which, especially when the nib is very fine, if it does not flow freely, quits it so slow as unpleasantly to retard the writer, and is totally unfit for fine manuscripts; besides, by such an union of gum and sugar, a degree of consistency is given to the liquor, which enables it to suspend a much greater portion of colouring matter than otherwise could be effected; a circumstance of the greatest importance to its hue and permanency. It is far from my design, in thus transmitting my ideas, to induce a supposition, that it is exactly after this manner that I, or any other person who supplies ink by wholesale, compound it; so far from it, that the first cost of one gallon, on the plan here suggested, would exceed twice the sum which is usually paid for it to the manufacturer, although, by retail, it is disposed of at an enormous rate. For private persons, therefore, who wish to be particular in their manuscripts, the rule I have here laid down will be found fully to answer their expectations at a cheaper rate than they are, in general, furnished with it. The best vessel, in my opinion, in which to make ink, is a common stone bottle, which will contain half as much more as is proposed to be made, and which should be agitated twice a day, and be left uncorked, in order to expose fresh surfaces of the liquor to the action of the air, without which it cannot be expected to write very black when first used, but, with this precaution, may be fit for use in about fourteen days; when it may be poured from its dregs, and corked up, to preserve it from dust, as well as waste by evaporation. In cold weather it should never be suffered to freeze, which is found to cause a disunion of its parts, nor does it ever afterwards recover its former intensity of colour, lustre, or durability. Many persons, I am aware, disapprove, and therefore omit, the use of logwood, from an apprehension that it induces a tendency in the ink to fade; this, however, from the strictest attention, I can assert to be fallacious, at least where it is not had recourse to by way of substitute for the other more expensive articles; indeed, its effects are quite the reverse, where all the ingredients are properly proportioned. As to the beautiful complexion which is given by it to the entire mass of fluid, it would be needless to insist, unless for the sake of those who are unacquainted how a mixture of the acetite of copper and logwood-liquor work together, and by which, in this instance, a richness and bloom is given, which can in no other way be got with equal economy and success; independent
of

of which, the colouring matter of the wood, by its affinity with the oxyde of iron, has a very powerful effect to blacken the ink, and to render it less capable of change from any unsaturated acid in the sulphat of iron, or from the operation of the air. I am aware, too, that the introduction of cupreous matter has been objected to, on the score of its injuring the penknife, by a portion of copper attaching itself thereto, in consequence of superior elective attraction, whereby it has been remarked, that a part of the knife's edge is dissolved, and a quantity of copper answering thereto is exchanged and deposited in its place, which is always said to happen when the pen retains a little ink at the time of its being mended. This, I think, is spinning out the effect of chemical affinity too far; for although, with respect to the reasoning, the truth must be admitted, I contend, notwithstanding, that its consequences to the edge are not apparent to the eye; nor is any sensible detrimental change thereby produced upon the knife, more than what is induced by any other ink into which neither the sulphat or the acetite of copper is introduced. As to myself, however, I have never yet seen a receipt for the formation of ink, where each of the principles were so completely proportioned and saturated with each other as to be inert when applied to the surface of a piece of polished metal, such as iron for example; nay, even the frequent contact of water only, if allowed to remain, would spoil any instrument made of that material. I shall not enlarge on this particular, conceiving the most powerful objection I can offer, in opposition to that opinion, is, that I have now lying by me a penknife, which has been in constant use between two and three years, and which even yet retains almost as good an edge as it had at first, by the mere assistance of an unprepared leather strap, although in the ink with which I write the acetite of copper has always been used. But even admitting, for argument's sake, that what I have attempted to disprove is true, how many hundred pens might be made and mended 'ere it would be requisite to bestow twopence to the cutler for the exercise of his art? In short, if the introduction of the substance alluded to into ink be a fault, I consider it as one of no consequence when put in competition with the advantages of beauty, durability, and intensity of colour, imparted by it.

I shall intrude no longer on the time or patience of your readers, than by requesting, if any of them are possessed of a cheap and efficacious method whereby the mouldiness of ink may be prevented, that they will communicate the same through the medium of your Magazine, in doing which a very considerable service will be rendered towards its perfectability. The admixture either of a small quantity of the muriate of soda, of the nitrate of pot-ash, of alcohol, or of cloves, have been severally recommended for this purpose; but, by experience, I know that of these only alcohol will avail, and this cannot be added in sufficient quantity without causing it to sink into, and spread upon, the paper; so that, indeed, *its* use is altogether interdicted. The best plan which I have hitherto found, as a preventive to the vegetative process I here allude to, is, to add the ingredients of which the ink is composed to the cold decoction: if recourse be had to boiling *ALL together*, it is found very rapidly to promote the inconvenience; and, were ebullition totally avoided, it would, on that account, be better, but then we could not obtain the ink of so deep a colour; yet, I know of no circumstance in which mouldiness will not appear in time, and that in no inconsiderable degree. In fine, I am ignorant of any substance, or method, that has

been hitherto used as a specific to remedy the defect. If there is any that can be suggested, I should be happy to put it to the test of experiment.

L. D. Jun.

ON THE VOLCANIC ISLAND NEAR ICELAND.

By Captain VON LÖWENÖRN, of the Danish Navy.

IN the spring of 1783, a volcanic island, thrown up in the neighbourhood of Iceland, excited no little attention. According to the account of the sea-captain who first saw it, exactly at the time when it first arose, smoke and flame seemed to rise from the sea, but no land or island was to be seen. It needs excite no wonder, therefore, that the observer was thrown into the greatest consternation, as he says himself, when he beheld the sea on fire! He and the whole crew, therefore, concluded that the end of the world had arrived, and they all began to prepare themselves for the awful moment: but, as they heard no trumpet, and as the sun shone in the firmament with his usual brightness, after considering what the phenomenon might be, they at last concluded that Iceland had been swallowed up by an earthquake; that this was a remainder of it; and that the flames arose from Hecla, the well-known volcano of that island. Full of this idea, they were just on the point of returning, in order to convey intelligence of this event to Denmark; but, very luckily, they soon after discovered the coast of Iceland.

The place where this volcanic eruption was seen lies only $7\frac{3}{4}$ nautical miles, fifteen to a degree, from the south-west extremity of Iceland. Hitherto they had seen no land, but, recognising Iceland, the ship reached the place of destination, and completed her voyage. Other ships, which arrived later, saw a small island from which the eruption had arisen; but it always exhibited, as might naturally be expected, a different appearance. The same year smoke and flames were seen to arise from the nearest part of the opposite coast of Iceland.

As there have been many instances of such eruptions from the sea producing islands, this event attracted the notice of government, and the year following orders were given to the ships bound to Iceland to examine the new island; but it had entirely disappeared, so that no traces of it were to be found. Towards the conclusion of the year, however, an unfortunate accident happened, which, without doubt, was occasioned by sunken rocks forming a part of the island which had disappeared.

A Danish ship, of 64 guns, called the *Infodfretten*, was expected from the East Indies, and intelligence had already been received that she had sailed from the Cape of Good Hope; but after that period no farther account was heard of her till the year 1785, when some vessels, returning from Iceland, reported, that some fragments of this ship, together with the long-boat, had been driven ashore on the coast of that island. According to every account, and by comparing the different circumstances, it appears to me certain, that the above ship was wrecked on these rocks, then no longer visible above the surface of the sea. It is impossible that such a large boat could have been conveyed from a ship without the hands of men, unless the ship had been dashed to pieces. This boat was not only driven to land entire, and in good condition, though without any person in it, but there was found in it a box filled with wax candles. At the distance of about a quarter of a mile from the boat there were found various pieces of the same ship, which could be easily known by some distinguishing marks. These parts, of different forms

forms and sizes, would not have been thrown on shore so near each other if the misfortune had happened at a greater distance; the billows, currents, &c. would certainly have driven them on shore at places more remote from each other. Besides, these fragments were driven on shore by a wind which blew in a direction from these rocks, and nothing else of this misfortune had been perceived on the coast.

From all these circumstances I conclude, that this vessel had experienced a very bad voyage home from the Cape of Good Hope, for that year easterly winds were exceedingly prevalent in the northern seas. A great many ships, and particularly men of war, preferring going round Great Britain to the passage through the Channel. It is probable that the ship in question may have been in want of some necessary, such, perhaps, as fresh water. The captain, besides, was well acquainted in Iceland, where I myself was with him, some years ago, as lieutenant on-board a ship which he then commanded, and, on this account, he probably intended to run into some of its harbours, but unfortunately struck on the sunken rocks, the remains of the volcanic island. In this distressed situation the crew, no doubt, had recourse to the only probable means left for saving their lives, by hoisting out their long-boat, and while employed in this labour the ship, it is likely, went to pieces, and the people were lost, as none of them were ever seen or heard of.

During my expedition to Iceland, in the year 1786, I made it my business to make some researches in regard to this volcanic island, though at that time no suspicion was entertained that the above ship had been wrecked in this place; for this conjecture was only a consequence drawn from my researches.

When I arrived in Iceland, where, on account of the business entrusted to my charge, as well as on account of the observations which I was obliged to make for the improvement of charts, I found it necessary to remain some time with my ship in Halmens-hafen, and had at my disposal a small vessel which was lying there, I ordered Lieutenant, now Captain, Grove, to cruise about with this small vessel in the neighbourhood of the place where the volcanic island had been seen. He remained there some days, and, though he often sounded with a line of more than a hundred fathoms, found no bottom, so that he lost all hope of making any discovery; but, just when he was about to return, he observed, contrary to all expectation, that the waves broke over some rocks lying exactly level with the surface of the water. As he now entertained no doubt that he had found what he had been sent in quest of, he took the bearings and distances from the nearest part of the coast of Iceland, and transmitted to me an account of his observations.

When the business of the expedition was ended, and I was about to return, at the end of the summer, I resolved to visit this interesting point myself, and to ascertain its real position by actual observation. I took my departure, therefore, from some small islands, or rocks, which lie before Cape Reikianös, the south-west extremity of Iceland, and the outermost of which is called the Grenadier's Cap, distant $3\frac{1}{2}$ miles south-west from the Cape. As the weather was exceedingly favourable, I was so fortunate as to obtain its latitude by the meridian altitude of the sun, and its longitude by a timekeeper. Though the timekeepers which I carried with me were not of the best kind, as I had quitted the same day one of the ports of Iceland, where I observed their rate of going, their relative errors could not be of great importance. I

determined, therefore, the position of the rock called the Grenadier's Cap at $63^{\circ} 43' 40''$ north latitude, and $25^{\circ} 35' 40''$ west longitude, from the meridian of Paris. This agreed pretty nearly with the observations of Verdun de la Crenne, Borda, and Pingré; especially as I have good reason to believe, that, from a want of sufficient knowledge of the coast of this country, they placed Cape Reikianös three minutes too far north, as they make the latitude to be $63^{\circ} 55'$. As I found also, by the most accurate observations that could be made at sea, that these dangerous rocks lie 47° in a direction south-west from the true meridian, and just four miles from the before-mentioned Grenadier's Cap, the position of these rocks will be $63^{\circ} 32' 45''$ north latitude, and $20^{\circ} 2' 50''$ west longitude, from the meridian of Paris.

As I now proceeded to get a sight of these rocks, Captain Grove, who was on-board my ship, concluded, from his former observations, that we could be at no great distance from them, having now quite lost sight of the Icelandic coast; and the before-mentioned rocks, which lie to the south-west from Iceland, though the weather was clear, being now scarcely discernible. My companion, therefore, asked whether it was prudent to advance so straight upon it. While we were talking on this subject, the people called out, and immediately every eye was directed to the spot, where we saw before us the waves breaking over a rock. We immediately put about ship, and heaved the lead, which was in readiness, and found the depth twenty-six, and soon after forty, fathoms, but a little farther no ground was to be found with a line of a hundred fathoms. Some tallow had been put into the bottom of the lead, as usual, to enable us to determine the nature of the bottom by the substances which adhered to it. By these means we obtained small fragments of stone which were entirely lava, or of a volcanic nature. The rock is not large, and the water around it is exceedingly deep. Its height is exactly equal to that of the surface of the sea, or rather a little lower; and, for that reason, it cannot be seen till one approaches very near to it, or when the waves break over it.

The origin of the volcanic island, which was seen in this place in the year 1783, I explain in the following manner:—The rock which now remains formed the crater, which at that period threw up flames and smoke. The large quantity of lava which issued from it, being accumulated on the bottom of the sea around the crater, may, at length, have been raised above the surface of the sea, and even to a considerable height. But, as this volcano lies in a part of the ocean where prodigious billows prevail, and roll over each other throughout a wide extent of sea, it is probable that such a structure would soon be destroyed by their violence, especially as there is a great depth of water around it, in which it might easily be overturned. It is known also, that the same year, a considerable quantity of pumice-stone, and volcanic substances of the like kind, the specific gravity of which was lighter than that of water, was cast on shore in Iceland, and found floating on the sea, by mariners.

Had the eruption taken place in a calmer sea, and the depth around it been less abrupt, the thrown up mass would have consolidated itself by its own weight, and would have in time become an island; of which we have had instances in the Archipelago, in the East Indies, and different parts of the ocean. Had it taken place on the continent, or in an island, it would have formed a mountain. It is not necessary that a volcano should always arise from a mountain: volcanoes have been seen to burst forth

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in plains; but the invariable consequence is, that the volcanic matter, by being accumulated, and, as it were, piled up, forms a mountain. Now, as the violence of the waves may have easily washed away the loose matter accumulated round the crater, there is no absurdity in supposing, that, as the billows rolled over the mouth of the crater, the fire was at length overcome by the water, and the volcano extinguished.

The crater, consisting of rock, has remained. It is well ascertained that a rock existed in this place before the eruption; and, it is confirmed, by late observations, that it exists still. An obscure notion prevailed among the seamen, who frequented Iceland, that there was a blind rock in this neighbourhood, called *Fugle-Skiör* (Bird's rock). This name I have retained in my charts, though the existence of it is denied by many seamen, because they passed without seeing it. But, under such circumstances, the testimony of one who has seen it is of more weight than an hundred who deny its existence because they did not see it. This confirms me in the opinion, that the crater had existed long before in the same state.

To conclude, it may not be superfluous to remark, in order to strengthen this opinion, that, nearly in the same direction from the south-west extremity of Iceland, as already mentioned, there are five small islands or rocks, the outermost of which lies at the distance of 33 miles from Cape Reikianös. Between these the water is deep: ships which go to, or come from, the west side of Iceland, commonly pass through them, when they first get sight of the land and rocks. By the Danish seamen they are called *Fugle Skiör*, because they are frequented by a great number of sea-fowl; but by the inhabitants they are called *Eld Eyarne*, (Fire islands.) May not this afford reason to conjecture, that in former times they had volcanic eruptions, and the volcano which appeared in 1783 may probably have existed long before?

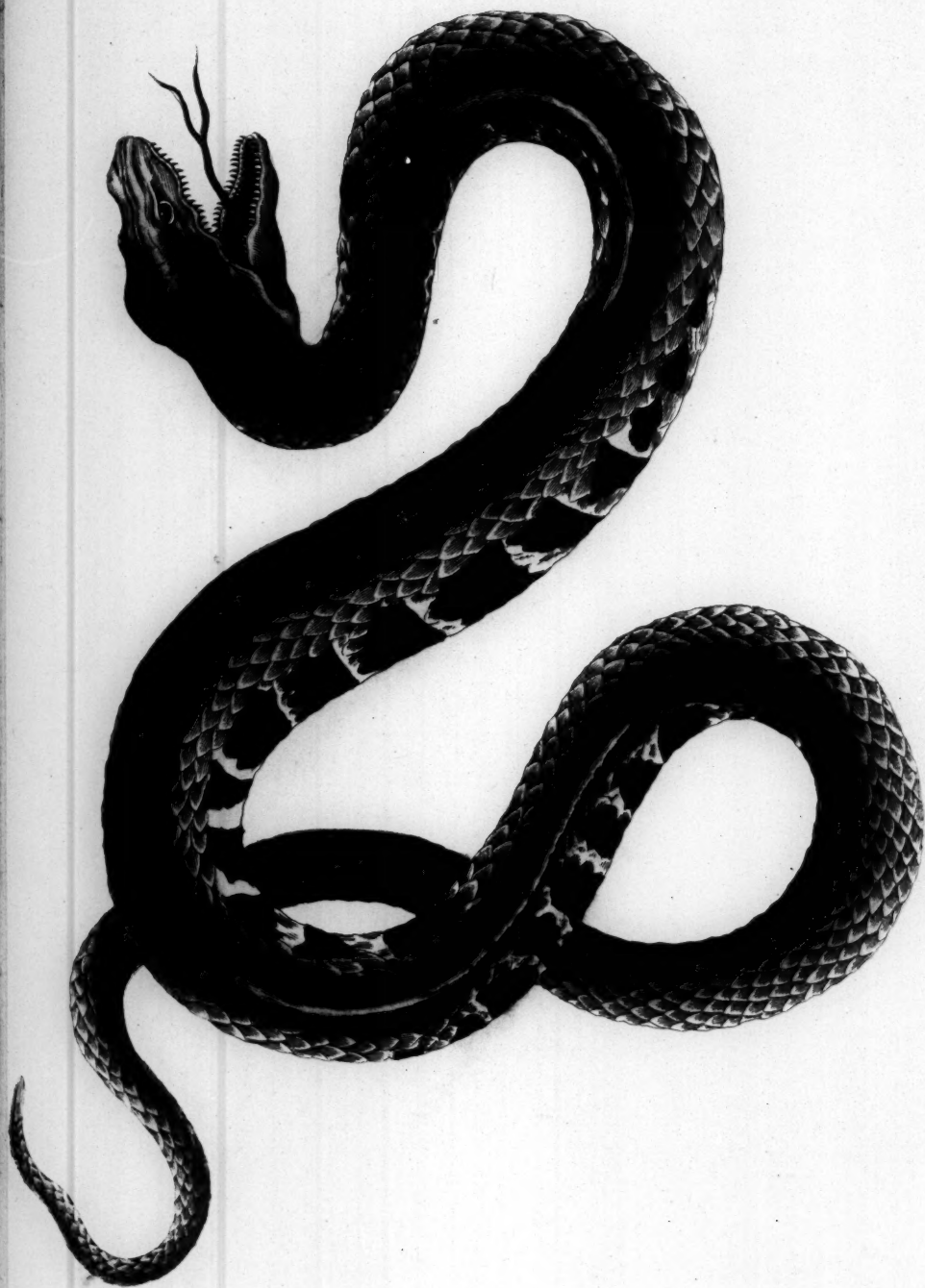
ACCOUNT OF THE EARTHQUAKE WHICH TOOK PLACE IN PERU IN THE YEAR 1797. By M. CAVANILLES.

THERE are reckoned to be more than sixteen volcanoes in the kingdom of Quiro, which are in a continual state of eruption, and which throw up thick vapours, often mixed with flames, either from their craters or through their lateral fissures. In the midst of the most profound calm there is frequently heard a dreadful bellowing noise, the forerunner of earthquakes, to which this part of the world is often exposed. After the year 1791, this noise was frequently heard in the neighbourhood of the mountain of Tunguragua. Antonio Pineda and Née, the two naturalists employed in the expedition round the world, when examining the declivity of this volcano, the lava of which had been hardened more by the internal fire than by the ardour of the sun, were struck with terror by the horrible sound which they heard, and the heat which they experienced. Pineda, that valuable member of society, whose premature death is still deplored by the friends of science, foretold that a terrible eruption was preparing in the mountain of Tunguragua; and his conjectures were confirmed by the event. On the 4th of February, 1797, at three quarters past seven in the morning, the summit of the volcano was more free from vapours than usual; the interior part of the mountain was agitated by frequent shocks, and the adjacent chains burst in such a manner, that, in the space of four minutes, an immense tract of country was convulsed by an undulating movement.

Never

Never did history relate the effects of an earthquake so extraordinary, and never did any phenomenon of nature produce more misfortunes, or destroy a greater number of human beings. A number of towns and villages were destroyed in a moment: some of them, such as Riobamba, Quero, Pelileo, Patate, Pillaro, were buried under the ruins of the neighbouring mountains; and others, in the jurisdictions of Harnbata, Latacunga, Guarandá, Riobamba, and Alausi, were entirely overthrown. Some sustained prodigious loss by the gulphs which were formed, and by the reflux of rivers intercepted in their course by mounds of earth; and others, though in part saved, were in such a shattered state, as to threaten their total ruin. The number of persons who perished, during the first and succeeding shocks, are estimated at 16,000. At ten o'clock in the morning, and four in the afternoon, the same day, (February 4,) after a dreadful noise, the earth was again agitated with great violence, and it did not cease to shake, though faintly, for the whole months of February and March; but, at three quarters past two in the morning of the 5th of April, the villages already ruined were again exposed to such violent shocks as would have been sufficient to destroy them. This extraordinary phenomenon was felt throughout the extent of 140 leagues from east to west, from the sea as far as the river Napo; and without doubt farther, for we are little acquainted with these districts, which are inhabited by the savages. The distance north-east and south-west, between Popajan and Piura, is reckoned to be 170 leagues; but, in the centre of that district, 1 degree 16' 6" from these places, is situated the part totally destroyed, and which comprehends forty leagues from north to south between Guarandam and Machache, and twenty leagues from east to west. But, as if an earthquake alone had not been sufficient to ruin this fertile and populous country, another misfortune, hitherto unknown, was added. The earth opened, and formed immense gulphs; the summits of the mountains tumbled down into the valleys, and, from the fissures in their sides there issued an immense quantity of fetid water, which in a little time filled up valleys a thousand feet in depth, and six hundred in breadth. It covered the villages, buildings, and inhabitants; choked up the sources of the purest springs, and, being condensed by desiccation, in the course of a few days, into an earthy and hard paste, it intercepted the course of rivers, made them flow backwards for the space of eighty-seven days, and converted whole districts of dry land into lakes. Very extraordinary phenomena, which will doubtless be one day mentioned in history, occurred during these earthquakes; I shall, however, content myself with mentioning only two of them. At the same moment that the earth shook, the lake of Quirotoa, near the village of Insilac, in the jurisdiction of Lacatunga, took fire, and the vapour which rose from it suffocated the cattle and flocks that were feeding in the neighbourhood. Near the village of Pelileo, a large mountain named Moya, which was overturned in an instant, threw out a prodigious stream of the before-mentioned thick fetid matter, which destroyed and covered the miserable remains of that city. Naturalists will one day find, in these ravaged countries, objects worthy of their researches. Fragments of the minerals and earths of Tunguragua are about to be transported to Spain: but it is not in such fragments that we ought to search for the cause of these surprising phenomena; we must visit the country itself, where this conflict of the elements took place, and where the ruins it occasioned are still to be seen.





THE AQUATIC VIPER.

Published as the property of Dr. J. A. Smith, 1874.

J. A. Smith.

Black, 1874.

ON THE CURE OF PERSONS BITTEN BY SNAKES IN INDIA.

By JOHN WILLIAMS, Esq.

THE following statement of facts, relative to the cure of persons bitten by snakes, selected from a number of cases which have come within my knowledge, require no prefatory introduction, as it points out the means of obtaining the greatest self-gratification the human mind is capable of experiencing; that of the preservation of the life of a fellow-creature; and snatching him from the jaws of death, by a method which every person is capable of availing himself of. Eau de luce, I learn from many communications which I have received from different parts of the country, answers as well as the pure caustic alkali spirit; and though, from its having some essential oils in its composition, it may not be so powerful, yet, as it must be given with water, it only requires to increase the dose in proportion; and, so long as it retains its milky white colour, it is sufficiently efficacious.

From the effect of a ligature applied between the part bitten and the heart, it is evident that the poison diffuses itself over the body, by the returning venous blood; destroying the irritability, and rendering the system paralytic. It is therefore probable that the volatile caustic alkali, in resisting the disease of the poison, does not act so much as a specific in destroying its quality, as by counteracting the effect on the system, by stimulating the fibres, and preserving that irritability which it tends to destroy.

CASE I. In the month of August, 1780, a servant of mine was bitten in the heel, as he supposed, by a snake; and in a few minutes was in great agony, with convulsions about the throat and jaws, and continual grinding of the teeth. Having a wish to try the effects of volatile alkali in such cases, I gave him about forty drops of eau de luce in water, and applied some of it to the part bitten. The dose was repeated every eight or ten minutes, till a small phialful was expended: it was near two hours before it could be said he was out of danger. A numbness and pricking sensation was perceived extending itself up to the knee, where a ligature was applied so tight as to stop the returning venous blood, which seemingly checked the progress of the deleterious poison. The foot and leg, up to where the ligature was made, were stiff and painful for several days, and, which appeared very singular, were covered with a branny scale.

The above was the first case in which I tried the effects of the volatile alkali, and, apprehending that the essential oils in the composition of eau de luce, though made of the strong caustic volatile spirit, would considerably diminish its powers, I was induced, the next opportunity that offered, to try the effects of pure volatile caustic alkali spirit, and accordingly prepared some from quicklime and the sal ammoniac of this country.

II. In July, 1782, a woman of the Brahmen cast, who lived in my neighbourhood, at Chunar, was bitten by a Cobra de Capello, between the thumb and fore finger of her right hand. Prayers and superstitious incantations were practised by the Brahmens about her, till she became speechless and convulsed, with locked jaws, and a profuse discharge of saliva running from her mouth. On being informed of the accident, I immediately sent a servant with a bottle of the volatile caustic alkali spirit, of which he poured about a tea-spoonful, mixed with water,
down

down her throat, and applied some of it to the part bitten. The dose was repeated a few minutes after, when she was evidently better, and in about half an hour was perfectly recovered.

This accident happened in a small hut, where I saw the snake, which was a middle-sized *Cobra de Capello*. The Brahmens would not allow it to be killed. In the above case no other means whatever were used for the recovery of the patient than are here recited.

III. A woman-servant in the family of a gentleman at Benares, was bitten in the foot by a *Cobra de Capello*. The gentleman immediately applied to me for some of the volatile caustic alkali, which I fortunately had by me. I gave her about sixty drops in water, and also applied some of it to the part bitten. In about seven or eight minutes after, she was perfectly recovered. In the above case I was not witness to the deleterious effect of the poison on the patient; but saw the snake after it was killed.

IV. In July, 1784, the wife of a servant of mine was bitten by a *Cobra de Capello*, on the outside of the little toe of her right foot. In a few minutes she became convulsed, particularly about the jaws and throat, with a continued gnawing of the teeth. She at first complained of a numbness, extending from the wound upwards; but no ligature was applied to the limb. About sixty drops of the volatile caustic spirit were given to her in water, by forcing open her mouth, which was strongly convulsed: in about seven minutes the dose was repeated, when the convulsions left her; and in three more she became sensible, and spoke to those who attended her. A few drops of the spirit had also been applied to the wound. The snake was killed and brought to me, which proved to be a *Cobra de Capello*.

V. As it is generally believed that the venom of snakes is more malignant during hot dry weather than at any other season, the following case, which occurred in the month of July, 1788, when the weather was extremely hot, no rain excepting a slight shower having fallen for many months, may not be unworthy of notice:—

A servant, belonging to an officer at Juanpoor, was bitten by a snake, on the leg, about two inches above the outer ancle. As the accident happened in the evening, he could not see what species of snake it was. He immediately tied a ligature above the part bitten; but was in a few minutes in such exquisite torture from pain, which extended up his body and to his head, that he soon became dizzy and senseless. On being informed of the accident, I sent my servant with a phial of the volatile caustic alkali, who found him, when he arrived, quite torpid, with the saliva running out of his mouth, and his jaws so fast locked as to render it necessary to use an instrument to open them and administer the medicine. About forty drops of the volatile caustic spirit were given to him in water, and applied to the wound; and the same dose repeated a few minutes after. In about half an hour he was perfectly recovered. On examining the part bitten, I could discover the marks of three fangs; two on one side, and one on the other; and, from the distance they were asunder, I should judge it a large snake. More than ten minutes did not appear to have elapsed from the time of his being bitten, till the medicine was administered. The wounds healed immediately, and he was able to attend to his duty the next day. Though the species of snake was not ascertained, yet, I judge, from the flow of saliva from the mouth, convulsive spasms of the jaws and throat, as well as from the marks of three fangs, that it must have been a *Cobra de Capello*; and though

though I have met with five and six fangs of different sizes in snakes of that species, I never observed the marks of more than two having been applied in biting in any other case which came within my knowledge.

VI. In September, 1786, a servant belonging to Captain S——, who was then at Benares, was bitten in the leg by a large Cobra de Capello. He saw the snake coming towards him, with his neck spread out in a very tremendous manner, and endeavoured to avoid him; but, before he could get out of his way, the snake seized him by the leg, and secured his hold for some time, as if he had not been able to extricate his teeth. Application was immediately made to his master for a remedy, who sent to consult me; but, before I arrived, had given him a quantity of sweet oil, which he drank. So soon as I saw him, I directed the usual dose of volatile caustic alkali to be given, which fortunately brought away the oil from his stomach, or it is probable that the stimulating effect of the volatile spirit would have been so much blunted by it, as to have become inefficacious: a second dose was immediately administered, and, some time after, a third. The man recovered in the course of a few hours. As oil is frequently administered as a remedy in the bite of snakes, I think it necessary to caution against the use of it with the volatile alkali, as it blunts the stimulating quality of the spirit, and renders it useless.

Of the numerous species of snakes which I have met with, not above six were provided with poisonous fangs; though I have examined many which have been considered by the natives as dangerous, without being able to discover any thing noxious in them.

The following is an instance of the deleterious effect of the bite of a snake, called by the natives Krait, a species of the Boa, which I have frequently met with in this part of the country:—

VII. On the 16th September, 1788, a man was brought to me, who had been bitten by a snake, with the marks of two fangs on two of his toes; he was said to have been bitten above an hour before I saw him: he was perfectly sensible, but complained of great pain in the parts bitten, with an unusual languor. I immediately gave him thirty drops of the volatile caustic alkali spirit in water, and applied some of it to the wounds. In a few minutes he became easier, and in about half an hour was carried away by his friends, with perfect confidence in his recovery, without having taken a second dose of the medicine, which indeed did not appear to have been necessary: but whether from the effect of the bite of the snake, or the motion of the dooly on which he was carried, I know not; but he became sick at the stomach, threw up the medicine, and died in about a quarter of an hour after. The man said that the snake came up to him while he was sitting on the ground; and that he put him away with his hand once, but that he turned about and bit him, as described. The snake was brought to me, which I examined: it was about two feet and a half long, of a lightish brown colour on the back, a white belly, and annulated from end to end with 208 abdominal and 46 tail scuta. I have met with several of them from thirteen inches to near three feet in length: it had two poisonous fangs in the upper jaw, which lay naked, with their points without the upper lip. It does not spread its neck, like the Cobra de Capello, when enraged; but is very active and quick in its motion.

I have seen instances of persons bitten by snakes, who have been so long without assistance, that, when they have been brought to me, they have not been able to swallow, from convulsions of the throat and

fauces, which is, I observe, a constant symptom of the bite of the *Cobra de Capello*: and indeed I have had many persons brought to me who had been apparently dead some time; but never knew an instance of the volatile caustic alkali failing in its effect, where the patient has been able to swallow it.

The following is recommended as a cure for the bite of all vipers, snakes, mad dogs, &c.—The person bitten must, as soon as possible, take inwardly half a spoonful of salt, and the juice of a lemon, or some good sharp vinegar, and with the same bathe the part bitten; and then, as soon as a red-hot iron can be got, burn the place bitten, after which bathe it with spirits of any kind, with camphire dissolved therein; it will soon become a running sore, and all the poison entered into the blood will run out at the place it came in. The above knowledge the writer acquired at the river Demerara, in the West Indies, and saved the life of a sailor, who was bit by the snake called *Borcy*, by lime-juice and salt, without which, all those bitten by that snake die within four hours, vomiting up all the blood from their stomachs, the vessels being burst.

ON THE STUDY OF NATURAL PHILOSOPHY, NATURAL HISTORY, AND MATHEMATICS.

ONE of the most material circumstances on which the relative value of an object of study depends, is, that it be something real, stable, of general import, and not indebted for its consequence to temporary and conventional modes of thinking. In this respect, nature has greatly the advantage over art. Whatever is learned concerning her is an eternal truth, which will preserve its relation to other things as long as the world endures. The motions of the heavenly bodies, the influence of the elements, the properties of minerals, vegetables, and animals, are *grand facts*, which speak a common language to all mankind in all ages, and afford a perpetual fund of use and entertainment. The more wide and comprehensive a survey is taken of these objects, the better they answer the purpose of enlarging the mind, and establishing a basis for truths of universal application. Hence the advantage of studying them in a connected and systematic mode, and framing general propositions concerning them. But the foundation for these must be a very accurate investigation of particular facts, since the instant their guidance is quitted, and reliance is placed upon analogical deductions, error commences. Observation and experiment must, therefore, go hand in hand with reasoning; nor was there ever a true philosopher who did not unite these processes. I can conceive of no employment of the human faculties nobler than those taking the scale of creation, detecting all its mutual connexions and dependencies, investigating the laws by which it is governed as a whole, and the œconomy, of its constituent parts, and alternately making use of the sagacity of the senses in minute research, and the powers of intellect in comparing and abstracting. The studies, then, which range under the heads of natural philosophy and natural history, and are comprehended under the general term of physics, appear to me to take the lead of all mental pursuits with respect to extent, variety, and dignity. Let it be understood, however, that I include among them the study of one of the noblest objects nature presents, and certainly the most interesting to a human creature—that of man himself. To ascertain what he essentially is, what are the faculties of body and mind, which characterize him as the head of the animal creation, and

and what are the variations induced in him by education, habit, climate, and mode of life, is strictly a branch of physics, and has, by the best writers, been treated as such.

It is, doubtless, impossible for a single mind to embrace all the objects here pointed out, so as to fathom the depths of human knowledge in each; to be, at the same time, the mind of Newton, Locke, Boyle, and Haller; but, according to the degree in which a man hath imbibed the leading ideas which constituted the intellectual furniture of such minds, I should estimate the value of his attainments; and I should prefer, though not in point of genius, yet with respect to acquisitions, one who combined a tolerably accurate acquaintance with all the branches of knowledge possessed by these, to a complete adept in any one of them. The last-mentioned of the above persons, Haller, was scarcely, I believe, surpassed by any man in the variety, and, at the same time, the solidity, of his physical knowledge. Buffon may be named as one whose general views were as grand, and whose pursuits were planned upon as enlarged a scale, as those of any person whom studies of this class have rendered famous, though he wanted accuracy and solidity in many of the particulars of his speculations. As a criterion of this capaciousness and elevation of understanding, I would suppose a delegate sent from this earth to explore some other world, and bring back the most complete and important information concerning it: the person duly selected for such a mission would, in my idea, possess a title to the superiority in question.

Although nature, thus studied, appears to me the noblest of all subjects that can occupy the mind, I am far from affixing the same proportionate value to investigations of detached parts of the works of nature. In these, all the grandeur of large and connected views is frequently lost, and the whole attention is employed on petty details, which lead to nothing further. A very little mind may successfully apply itself to the arrangement of shells and butterflies by their forms and colours, and gain nothing by the process but the simple ideas of form and colour, as serving for marks of distinction. To such minds, an arrangement of ribbands, by their shades and patterns, would be a perfectly similar employment. I do not deny that even these humble labourers in science are necessary to complete the great fabric of the system of nature, and give accuracy and uniformity to its nomenclature. Their industry and exactness deserve praise; but it is better for a student, capable of more extensive views, to make use of their labours, than to imitate them. What I have said, however, must be understood with limitation; for, as I have already observed, it is incumbent on the inquirer into nature to spare no pains in the accurate search after facts; but these should be facts not trifling or insulated, but essential to the formation of those general theorems in which systematical knowledge consists. It is certain, for instance, that while the Linnæan class of *cryptogamia* subsists, the vegetable economy must be very incompletely known. It cannot, however, be abolished without the minutest examination of the generative organs of mosses, ferns, algæ, lichens, &c. which may, therefore, reasonably employ the ablest and most philosophical naturalist. Bonnet, a philosopher in every sense of the word, occupied himself for years in microscopical observations and experiments on the smallest parts of nature, but it was with the purpose of establishing important conclusions concerning the essential characters of the animal and vegetable kingdoms, and the limits between each. Modern

chemistry is one of the most important branches of physics, and comprehends many truly sublime speculations relative to the globe we inhabit; but its theory is entirely built upon experiments, in which the nicest mechanical attentions are necessary to avoid fundamental errors.

Mathematical studies must already be supposed to stand high in my estimate, since I have placed in the first class those large and sublime views of nature, some of which could not originally have been formed, nor can now be comprehended, without the principles of mathematics. But, besides their undoubted value as means, they have, by many, been pursued ultimately, as affording the highest and purest exercise to the intellectual powers.

Fully sensible of my own inadequacy to judge of their worth in this respect, and, fearful of giving way to partiality, I shall only speak of them from observing their effects upon others. As far as I have remarked, few of those who, during the early part of their lives, have gone deep into mathematics, acquire such a relish for them, as to be induced spontaneously to continue their application to them at an after-period. Whether it be that they find the requisite mental exertion too severe, or that they become wearied with studies which offer no further prospects, and furnish no materials for conversation, it seems to me to be the fact, that mathematical pursuits are usually deserted as soon as the incidental motives which caused them to be entered upon, or the first ardour of curiosity, have ceased. Where this has not been the case, they are sometimes found to occupy the whole mind, to the exclusion of all other objects, pleasant or useful; and, surely the ideas of figure and number alone are insufficient to fill the compass of the human understanding. A story is told of a profound mathematician, who being with difficulty persuaded to read through Homer's *Iliad*, coldly observed at the conclusion, that he did not find that the author had *proved* any thing. It would, however, be very unjust to represent this insensibility as the universal result of mathematical studies. Many instances may be produced of their alliance, in the same person, with polite and philosophical literature. Of these, it will suffice to mention the late celebrated d'Alembert, a distinguished member, at the same time, of the Academy of Sciences and the French Academy, and an admired writer on a variety of topics. A proficiency in abstract mathematics is certainly an undoubted proof of great mental capacity; and I suppose the extent of the study is such, that no apprehensions need be entertained of exhausting its objects. Whether, with no further view, it be worth while to expend so much time and exertion upon it, I leave you to determine for yourself.

Without tracing farther the circle of human knowledge, I shall bring my letter to a conclusion after a general observation. No kinds of study can differ more from each other than the same from itself, as pursued by a man of a strong, and, by one of a weak, understanding. The first will render a small object important; the second, an important one little. The history of literature abounds with instances in proof of this assertion: I shall mention one. Elias Ashmole, in the last century, obtained considerable reputation here in the multifarious character of a *philosopher*. He was an astronomer, but this noble science in his hands turned to judicial astrology. He was a chemist, but under this title alchemy was the real object of his pursuit. He was a naturalist, but his taste rather led him to be a collector than a scientific observer of nature. He was an antiquary, and, in that capacity, made large

large collections for the history of free-masonry in this country : afterwards he soared to the most noble order of the garter, the history of which, with all its laws and institutions, was his *opus magnum*. In this man were united the valuable qualities of industry, exactness, and perseverance ; but the foundation of good sense was wanting.—How different from one ‘ *qui nil molitur inepte*,’ all whose pursuits are directed by a sound understanding ! Such an one was the wise Franklin, who, from the most trivial facts, could deduce the most important conclusions—who had always something truly valuable in prospect—and whose touch converted every meaner material to gold.

It is not, then, merely the species of study, but the mind and spirit with which it is pursued, that should regulate our estimate of the intellectual powers of the study. Folly often conceals herself under the mask of seriousness, and wisdom sometimes is light and playful. The latter knows the hazards nothing by occasionally descending from her dignity ; whereas folly loses all by losing appearances. A great latitude of mental occupation may be admitted, provided good sense presides over all—that quality which truly is, as our ethical poets assert,

‘ Though no science, fairly worth the seven.’

FRUITLESS CURIOSITY ; AN EASTERN TALE.

IN the city of Oojein, there was a young merchant, named Yezez, who abounded in wealth, and had never yet experienced the damp of misfortune. His days constantly passed in music and feasting. One day he was enjoying the festivity of a jovial company, when in the midst thereof a stranger appeared, and, sitting down on a corner of the carpet, cast a look of sadness on the assembly. All at once they were infected with his melancholy, and re-echoed his sighs. Yezez enquired into the situation of this stranger, who, though repeatedly questioned, made no answer. This added to Yezez’s surprise, and increased his impatience, and he continued to importune the stranger, who at length said :

“ Although thy request might have been with-held, and can do thee no good, yet I shall comply with it. Know then, that formerly my wealth and possessions were great beyond calculation. Having at one time, according to the custom of merchants, prepared a valuable assortment of goods, with an eye to profit, I departed for the city of Kinnouje. Several capital merchants accompanied me on the journey. At about four days distance from Kinnouje, having accidentally separated from the caravan, I strayed into a wilderness, where I had almost lost myself, as nothing appeared before me but a frightful desert. In every path that I explored from morning to evening, I found no resting place, while at every distant horrible sounds struck my ear, and I every now and then perceived strange phantoms, which made my heart tremble.

“ As the gloom of night advanced, the plain appeared to my imagination as a stormy sea, whose billows would swallow up the fish of the sky. The branches of the trees, beating against each other from the violence of the wind, bowed to the ground ; the sand of which, agitated by the storm, rose in waves, so that you might call them the serpents of Pharoah’s rod, ready to devour the world. Helpless, I resigned myself to destruction, and sat down at the foot of a tree, expecting instant death. Suddenly the sound of human feet was heard, and, on turning my eyes that way, I beheld a person advancing with great celerity ; as if flying on the wings of speed. Alarmed, I endeavoured to hide myself, and invoked

invoked heaven for protection. The man, however, coming up, exclaimed, Who art thou? and what dost thou in this perilous desert alone? Fear kept me silent, when, advancing with great fury toward me, he said, inform me of thy circumstances, or I will sever thy head from thy body with my sabre. In dread of my life, I attempted to reply, and said, O valiant youth, be not enraged, for I am a mortal, who by accident being separated from my camp, have been bewildered in this desert; have pity upon my forlorn condition; direct me in my paths, that I may rejoin my friends.

"When the young man was informed of my situation, his wrath gave way to compassion: Recover, said he, from your fears, and you shall instantly be delivered from this dreadful place. Not far from hence is a most delightful city, whose site, like the gardens of paradise, dispels care, and whose inhabitants are enchanting as the dwellers in heaven. It has been from ancient days called the city of Laabutbauz, and I am named Rizwaun by the happy inhabitants. Hasten then, and follow me.

"As I had observed in the young man the manners of courtesy and an affable behaviour, I gave thanks to heaven, and followed him close, till at length we reached the gate of the city, and, on seeing its beauty, I fancied myself in heaven, and gazed with astonishment."

The stranger had advanced thus far in his narrative, when suddenly two wild cats, clasping each other with fury, dropped from the balustrade of the house into the midst of the company, who were most attentively listening. Alarmed at this occurrence, they all startled, and the stranger unperceived vanished from among them. When Yezez had recovered himself, he was greatly distressed at the departure of the traveller, and that his story was not concluded; persons ran to every quarter to seek for him, but he was not to be found. Such was the curiosity of Yezez to know the remainder of his adventures, as to exceed all bounds, and he resolved on a journey to Kinnouje, against all the remonstrances of his friends and relations. He set out with a few beloved companions, and in a short time reached Kinnouje, where he explored every part, but found no intelligence of the young man. Day by day he became so impatient that it wasted his health and his substance; his companions left him, and he submitted to poverty, diving sometimes into the forest, and sometimes winding the desert. In this manner he explored many countries, but without success. Incessant fatigue reduced his body to a skeleton.

At length one day, as he was passing over a desert, and notwithstanding all his endeavours could not reach a place of shelter, he met a compassionate looking youth, who tenderly enquired the cause of his distress. Yezez, having related his adventures, requested his assistance to heal his sorrows. The youth replied, "Ah, thou fool, what miseries hast thou brought upon thyself! Merely upon hearing a tale from an unknown person, without examining into the truth or probability of it, to commit thyself a wanderer in the desert, and foolishly to measure the wind with thy hand, was not wise. Thy difficulties are impossible to be relieved, so hasten away, and follow thy own policy." Yezez replied, "O generous youth, since absenting myself from my family I am involved in a bewildering path; how can my spirit allow me to return back when advanced half way, without having obtained my object? For God's sake, exert thy liberality, and, as far as in thy power, lend me thy assistance." The youth rejoined, "Imprudent man, how canst thou, by my assistance,

assistance, arrive at the city of Laabutbauz, which has no existence upon the face of the earth? Escape therefore out of this wilderness, and get thee into a place of safety. Take this ivory sabre, and, whenever thou art fatigued and inclined to rest, draw it from the silken scabbard, and lay it carefully by thee. When thou continuest thy journey, sheath it, and be cautious not to lose it." Having said this, the young man vanished from his sight.

Yezez now betook him again to travel, and, heedless of the precipices and declivities in his route, with cheerfulness submitted to the toil of walking till evening. He then stopped, and, as he had been desired, drew the sabre from the scabbard; when lo! a vast city appeared in the plain, of such extent as fancy could but feebly describe. Having retired to a house, he chose an apartment, and being refreshed with ample fare, betook himself to sleep. In the morning, having girded on his sabre, he resumed his travel in the wilderness, and, after having been for many days supplied with resting places at night by the power of the sword, he one day found himself on the bank of a lake, and stopped to quench his thirst. Suddenly, as he was drinking, the belt of the sabre breaking in the middle, it fell into the water, sunk to the bottom, and was irrecoverably lost.

On this accident, despair possessed his mind, and he wandered in the deepest distress. At length, he reached a plantation, where he beheld a husbandman sitting on the grass, who repeatedly lifted up a cup to his lips, while his wife scattered seeds on the soil he had dug. An inclination to associate with the husbandman arose in the mind of Yezez, and, advancing a little, he sat down at a distance. The countryman and his wife, looking upon him with kindness, enquired his situation; upon which, Yezez recounted his adventures, and signified the object of his heart. The husbandman replied, "Ah! beautiful youth, what vain scheme and idle speculation is this! Wander not foolishly in the path of destruction, but quit this dangerous expedition, for it is impossible it should succeed. Associate with us, that thou mayest repose from the persecution of fortune." Yezez accepted his offer, and rested from the fatigue of unavailing travel.

As it happened, in this plantation, just after the breathing of dawn, every morning arose a misty vapour, which, by degrees descending, wholly enveloped the branches and leaves of a particular tree. Gleams of light then shone through the mist, and a hand, dazzling as the sun, was extended from it. The husbandman advancing near the tree, in the manner of ceremonious cupbearers, placed a goblet of sparkling wine on the hand, which for an instant vanished, and re-appearing, gave back the goblet empty. This was repeated to the fortieth cup; after which the hand withdrawing, the vapour began to ascend, and quickly diffusing itself in the air, in less than an hour was wholly dispersed.

After some time, the husbandman having occasion to leave home for a few days, entrusted the care of his house to Yezez, giving him a particular charge to supply the hand regularly with wine. The imprudent youth, impelled by curiosity to penetrate into the mystery, as he was one morning delivering the cup, rashly grasped the hand with all his force, when instantly a noise, more dreadful than the loudest thunder, shook the atmosphere, and a bird of monstrous size, issuing from the mist, seized him in its talons like a sparrow, and mounted into the air above the highest clouds, then gradually descending, at length alighted on the pinnacle of a lofty dome, when, losing its hold, Yezez rolled over and over,

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like a ball. He at length fell to the bottom of a pit, so dark that night, from its blackness, might have added to her gloom. Much as he tried to explore a passage, he found no inlet to the path of hope, so that, preparing himself for death, he sat down, expecting his fate.

In this state, he at length perceived a glimmering of light, and, on examining the place whence it proceeded, saw a door which opened to his pressure into a narrow passage, through which having passed, he found himself in a court surrounded by a high wall. Having climbed to the top, he let himself down by his hands on the other side, and fell into a net placed below. A man rushing upon him, flung a rope round his neck, and dragged him to the foot of a lofty building, from a window of which a beautiful damsel looking out, said to his conductor, 'To-day's game is very thin, let him be released for some time, till he shall be worthy our acceptance.' Upon this the man set him at liberty; when Yezez, overcome by fear and fatigue, fell down senseless on the ground.

On his recovery, he found himself alone in the midst of a barren plain. Suddenly advanced toward him on horseback an old man, who, on coming up, enquired the cause of his distressed situation; and, on being informed of his adventures, consoled his sorrows, and presented him with refreshments, on tasting which his strength returned, and his spirits were revived. The old man then having directed him to follow a particular path, took his leave, assuring him that he would soon arrive at the object of his hope.

Yezez, having thanked his generous preserver, proceeded with lightened heart, and renewed ardour. Travelling all night, he arrived by day-break at the skirts of a city, of most elegant building. The environs of it were also delightful. On every side flowed deliciously-tasted streams among beds of flowers, as in the gardens of heaven. Yezez remained for some time motionless as a statue; and, when recovered, hastened to the city. On his arrival at the gate-way, he saw the doors set with valuable jewels, and the way paved with agate, sprinkled over with musk. The paths were clear from soil as the hearts of the virtuous; and the air, like the air of melody, gave relief to the sorrowful heart. The streets, like the fumes of wine, excited cheerfulness; and the houses, as the regular rows of an avenue, afforded sensations of serenity.

While he was meditating and admiring these objects, two young men advanced with speed, and each seizing an arm, conducted him to a splendid palace. He was then led to a warm bath, and, after washing, being rubbed with perfumes and essences, was arrayed in royal robes, and a splendid crown set with jewels was placed on his head. From the bath he was introduced in a sumptuous hall, and seated upon a gorgeous throne, befitting the state of a powerful monarch. The nobles of the empire and officers of state, like respectful slaves, having made the usual prostrations, and kissed the ground, raised their congratulations to the skies. Yezez remained without power to speak, lost in astonishment and doubt whether he was in a dream or awake.

At length, a venerable vizier informed him that he was in the city of Laabutbauz, the sovereign of which was just deceased; and, according to the laws of the empire, he, as the first stranger arrived, was his successor in the throne, and to be united in marriage to the beautiful daughter of the late monarch; but on condition, however, that he must make no dishonourable attempts on the royal haram. Yezez, on hearing this speech, was overcome with a joy that cannot be described.

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When the sun descended to the west, a splendid throne set with jewels was placed in the apartment, on which the beautiful princess, most richly adorned, sat like a brilliant star in the throne of the sky. They showered garlands of flowers upon her head, and made offerings of rubies and pearls. When the lucky instant for the king's admission arrived, the attendants withdrew from the bridal chamber, from the door of which, to the hall of public audience, rosy-cheeked damsels, elegantly attired, lined the way in two rows of dazzling beauty.

When the bride and bridegroom were seated on the same throne, they seemed as two cypresses in the same border, or as the sun and moon conjoined in one sign. The female attendants formed a ring about the throne, like planets round the sun; and, having made their obeisance, began to sing and dance, playing, at the same time, on various instruments. The king became so enraptured at their performances, that he lost all discretion, and, forgetting the vizier's conditions, attempted to kiss the princess; who, dissembling her displeasure, gently rebuked his ardour, and filling a goblet with wine, presented it to him, which he had no sooner drank, than he fell senseless asleep.

In the morning, on awaking, Yezeez gazed wildly around, but perceived no ray from the sun of beauty, nor any trace of last night's festivity. On the contrary, he found himself in a dreary wild, still doomed to the horrors of solitude; again he began to travel, but had not gone far, when, to his astonishment, he suddenly beheld the walls of Oojein. His disappointment overwhelmed him with despair, and in this condition he entered his own mansion. Having distributed the remainder of his effects to the poor, he entered a society of devotees, and fixed his abode in a forest unfrequented by man, where he spent the remains of his miserable life.

This disordered world, of frail foundation, is the abode of visionary deception, in which those ensnared by its temptations acquire only shame and remorse. It is a store of concealed miseries, and those who quaff the goblet of its enjoyments, swallow the bitter portion of repentance. Let those who give the rein to impatient curiosity and wild desires, think of the fate of Yezeez.

WEST-INDIA WET DOCKS.

SOME months ago (p. 164 & seq. of this volume) we detailed some of the principal arguments for and against the measure of erecting docks for the reception of ships of a certain burthen, which was then in agitation. The act for carrying the same into effect was passed on the 12th of July, 1799; and, on the anniversary of that day, namely, on Saturday, the 12th of July last, the ceremony of laying the first stone of the buildings of this magnificent undertaking was performed. The company assembled at the London Tavern, at one o'clock, and moved in the following procession to the Isle of Dogs:

The DIRECTORS of the WEST-INDIA DOCK COMPANY;
and, in the last of their carriages,

The CHAIRMAN and DEPUTY CHAIRMAN; then

The LORD CHANCELLOR,

Earl SPENCER,

Lord HAWKESBURY,

Right Hon. WILLIAM PITT,

Right Hon. HENRY DUNDAS,

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Right Hon. DUDLEY RYDER,

Right Hon. THOMAS STEELE,

Right Hon. SILVESTER DOUGLAS,

Sir JOSEPH BANKS, Bart. K. B.

Sir AND. SNAPE HAMMOND, Bt.

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and a numerous train of members of parliament, including those of the select committee of the house of commons for the improvement of the port of London.

Soon after two, the procession arrived at the works, where Lord Carrington, and many other distinguished personages of both sexes, had assembled, to be present at the ceremony, which was conducted in the following manner:—The stone had been previously prepared to receive two glass bottles, one of which contained the several coins (gold, silver, and copper) of his present majesty's reign, and in the other, the following inscription and translation thereof in Latin, were placed;

Of this Range of Buildings
Constructed, together with the adjacent Docks, at the Expence of
public spirited Individuals,

Under the Sanction of a provident Legislature,
And with the liberal co-operation of the Corporate Body of the City
of London,

For the distinct Purpose of complete Security and ample Accommodation
(hitherto not afforded)

To the Shipping and Produce of the West-Indies at this wealthy Port,

THE FIRST STONE WAS LAID

On Saturday, the Twelfth Day of July, A. D. 1800,

By the concurring Hands of

THE RIGHT HONOURABLE LORD LOUGHBOROUGH,
Lord High Chancellor of Great Britain;

THE RIGHT HONOURABLE WILLIAM PITT,
First Lord Commissioner of his Majesty's Treasury, and Chancellor of
his Majesty's Exchequer;

GEORGE HIBBERT Esq. the Chairman,
and

ROBERT MILLIGAN, Esq. the Deputy Chairman,
OF THE WEST-INDIA DOCK COMPANY;

The two former, conspicuous in the Band

Of those illustrious Statesmen

Who, in either House of Parliament, have been zealous to promote,
The two latter distinguished among those chosen to direct,

AN UNDERTAKING

Which, under the Favour of GOD, shall contribute
Stability, Increase, and Ornament, to

BRITISH COMMERCE.

The bottles being deposited in the recesses made to receive them, and also a plate with the directors' names engraved thereon, Mr. Tyrrell, the clerk and solicitor to the West-India Dock Company, read the inscription, and the four noble and honourable personages named for that purpose, raised the stone, (by means of four rings fixed thereto,) and laid it in the proper situation. The spectators then gave three times three hearty cheers, and declared their best wishes for the success of the undertaking. After the ceremony, the company viewed the extensive works carrying on at the Isle of Dogs, and expressed great pleasure and satisfaction at the spirited exertion manifested by the progress already made in a concern of such magnitude. The company afterwards returned by water from Blackwall, in the barges belonging to the Admiralty and Navy Boards, &c. &c. which were in attendance on the occasion.

An elegant entertainment was provided at the London Tavern, where the

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the Duke of Portland, and several other noblemen and gentlemen of distinction, joined the company; and the remainder of the day passed as usual upon such occasions.

CEREMONIES EMPLOYED AT THE BURNING OF THE BODY OF A DECEASED LAMA AMONG THE CALMUC TARTARS.

IN the year 1772, the chief lama of the Derbet horde of the Calmucs, on the Wolga, named Abagai, died at his residence not far from Sarepta, in the 94th year of his age, after a tedious illness. When this event was made known, all the *labans*, or *gellongs*, that is, priests, then present, assembled to deliberate how they should dispose of the body, according to the rules prescribed in their sacred books; and an account of this remarkable death was immediately transmitted to the prince of the horde, Zebek Ubuschi, and to his ministers. He was visited also by all the priests, who requested that he would order the one next in rank to the deceased to repair to his late residence, for the purpose of carrying into execution the command of the sacred books. This office fell to the lot of Samtan, or Dajantshi Lama, who had received the latter title of honour on account of his having lived in a monastery, or hermitage, till he attained to that rank. Early in the morning, next day, he set out for Sarepta, with a numerous train of priests, as the intended successor of the deceased lama.

As, on such occasions, each priest receives a considerable part of the property left by the deceased lama, the number assembled was exceedingly great; so that, in the course of a day and a half, above 70 gellongs, and many others of inferior rank, were collected. For those of the highest rank, a sufficient number of horses, partly saddled, and partly unsaddled, were provided, and distributed among them according to their dignity. There was also plenty of sheep, and other animals, intended to be killed for food. The Dajantshi Lama then called the priests together, to regulate the funeral ceremonies. For that purpose the sacred books, which had, till that period, been kept closely shut up, were produced; and, after all the circumstances attending the lama's death, together with the time, had been compared with the rules in these books, it was concluded that the body should be burnt.

The place appointed by the new lama for performing the ceremony was the Moo-Chammur, or summit of a sandy hill, near Sarepta; from which the hut of the deceased, where strict guard was kept to prevent any one from approaching it, was distant only a few hundred paces. The foundation of a furnace was then accurately measured out by the lama himself; and the earth was dug up with great care and solemnity by the gellongs and priests; for no person of any other condition durst put a hand to the work. During this labour, the lama, accompanied by the most distinguished of the priests, returned to the habitation of the deceased, where they sat down in a circle, and prayed from books with great earnestness and fervour. While they were thus employed, the deceased was stripped of his usual clothing, and his yellow ornaments, *jamon chubzusun*, were put upon the body, together with a yellow lackered five-pointed crown, called *ooli-malachai*. His throne, on which he had breathed his last, with a devout benevolent aspect, sitting cross-legged, with his hands folded, was raised up, and, after his wide yellow drefs had been spread out around it, he was suffered to remain in that state. The entrance of the habitation was

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covered by a particular kind of curtain, and guards were placed on each side to prevent the common people from looking in when the priests entered or went out.

In the mean time the prayers were continued at intervals; and, on a certain signal being given, the people, assembled without, were suffered to enter, one by one, uncovered, in order that they might pay their last respect to the deceased, by kneeling and touching his yellow robe with their foreheads. As the number collected was, however, too great, the new lama at length went out, and bestowed his benediction on all those within his reach, by laying his rosary (*erken*) on their head; but, as the throng around him increased more and more, he distributed a general benediction among the whole multitude, by waving the rosary, after which he returned to pray, with deep sighing and fobbing. Such of the people as had not obtained the lama's benediction, shewed their respect and veneration by walking round the hut of their deceased, and, as it were, deified lama; and counting their beads, amidst continual sighs, while they repeated, by way of prayer, the monosyllables *om ma ni pat me chung*; and every now and then, in going round, threw themselves down, with their faces towards the earth, before the door of the hut.

After some time, two singular figures, made of dough, were brought out from the hut, on wooden trenchers, and borne towards the place destined for the furnace. They had each two legs and two arms; but, in other respects, they bore a greater resemblance to devils than to men.

While prayers were performing in the hut of the deceased, the rest of the priests sat together in circles, dispersed here and there, filled with consternation, and viewing attentively what was going on. A deputation, appointed by the new lama, made a distribution to the priests, according to their rank, of the cattle and other property left by the deceased; and, by command of the prince, six hundred rubles, in ready money, were collected from the horde, to defray the expence of the funeral, and to be divided among the priests.

The four sides of the foundation, dug for the furnace, in which the body was to be burnt, were directed towards the four cardinal points. On the north, south, and east, sides, large fire holes were dug, and covered towards the side of the furnace with earth, that the wood might lie under the covering, and not within the furnace itself, to prevent any of the ashes of the wood from being mixed with the ashes of the body. The bottom was then constructed of tiles, which had been conveyed on horseback by gellongs from the distance of some wersts; and, instead of lime, clay was employed to cement them. When the furnace was raised about a foot above the earth, a large iron tripod, made for the purpose, was fixed in the middle of it, and one of the gellongs immediately placed himself in the furnace, cross-legged, on the tripod, in order to try whether it would answer the intended purpose. A kind of hut was then erected around the furnace, with poles, which were covered up to the top with pieces of old felt. This hut was about eighteen or twenty feet in height; and, at the top was a large opening, to afford a passage to the flame and the smoke.

All the priests who were present, after viewing the furnace, went in procession, accompanied by the new lama, to the habitation of the deceased, where the fifteen priests, who were to officiate, put on the dress peculiar to their office. This dress consisted, first, of a sort of shirt, called *busehan majak*, which the priests use instead of breeches and stockings,

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stockings. It is worn next the skin, and is gathered in plaits, and fastened round the middle, by means of a broad girdle. Over this was put the *schübi chubzusun*, which is a short red shirt without sleeves, and open at the breast; also the *gika majak*, a piece of red cloth, placed around the body in folds, above the first short *majak*, and fastened by means of a red sash; the second *majak* must hang down, almost to the heels. The chief lama, alone, had a *jamohn chubzusun*, or red shirt, with short sleeves, which was fastened by means of a broad yellow girdle. In the last place, all of them had a *ischogi chubzusun*, or large square piece of silk, which, except a border, two spans in breadth, consisted of red and yellow patches, four inches square, disposed checquer-wise. Some, however, had this piece of silk entirely yellow. It was thrown over the shoulders, so as to reach the ground behind; and the two corners of it before were fastened over each other on the breast. The arms, head, and legs, during the ceremony, were bare; and each had wound his rosary around his arm; all which gave them a very terrible appearance.

After they had put on their dress, a certain kind of vessel called *ordu charafsch*, was brought forth, and put into the hands of the *bak/ki*, or instructing priest, who walked next to the lama; and who, instead of the variegated piece of silk, had one entirely red. Another small metal vessel, of costly workmanship, containing sacred water, mixed with spices and sugar, and ornamented at top with a very beautiful peacock's feather, was delivered to the lama, and borne by him at the head of the procession. Eight of the gellongs, dressed as above described, supported the bier, and the other five had in their hand each a bell. The habitation of the deceased was torn open behind with the utmost expedition, and the body, after the large yellow silk cloth suspended from its shoulders had been thrown entirely over it, and the high spiked crown had been put on its head, was taken out, and placed, in a sitting posture, on a bier made for the purpose. The bier was borne by the eight gellongs, and the procession moved towards the furnace in the following order; first, the lama, then the *bakschi*, after him the dead body, then the five gellongs, with their bells, and, in the last place, the remainder of the music and the people. During the procession, the lama, every now and then, dipped the peacock's feather in the sacred water, and sprinkled it every where around him.

The instruments of music, besides the bells, were three long copper trumpets, which emitted, at most, two or three bass notes, and which followed behind. They were full three yards in length, and therefore were suspended by rings to two poles, and, in that manner, carried by two men. There were also four drums suspended from a pole; and two musicians, with brass cymbals, which were beat in the same manner as the Turkish.

The people, who had assembled in crowds on all sides, were kept off by priests appointed for that purpose, and armed with strong cudgels. As soon as the procession reached the furnace, the musicians placed themselves in a semicircle before the entrance of the hut, and made a loud noise with their instruments. The body of the deceased lama was then carried, with great speed, into the hut, and placed on the tripod, after the crown and yellow covering had been taken from it. Both these articles were afterwards conveyed back, with the same procession and music, to the habitation of the new lama. The next operation was to complete the construction of the furnace, which was done with great privacy.

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privacy. Two pieces of iron were put round the neck of the deceased, projecting so far on each side, that the ends of them could be built into the wall. These served to keep the body upright in the midst of the fire. The top of the furnace was arched, in a sloping manner, over the head of the dead body; and, on the west side, where there were no fire-holes, a square opening was left in the top, through which, while the body was in a state of combustion, tallow and other inflammable substances were poured. The wood destined for fuel was all cut, exactly of the length of the fire-holes, and a great quantity of butter, incense, and resin, was intermixed with it. Near the furnace was placed a kettle, in which the butter was melted with the other ingredients: and, on both sides of the furnace, there were small altars, covered, as usual, with sacred vessels and lamps. A magnificent throne was prepared, on the west side, for the officiating lama; and, when every thing was ready, the lama put on the yellow wrapper of the deceased, placed his crown on his head, and seated himself on the throne. The gellongs, who had laid aside their sacerdotal habits, and assumed their usual dress, sat down in a circle around him. Each had a bell in his left hand, and a book lying before him, on his knees, and on a signal given by the lama, the small lamps on the altar, and the wood in the three fire-holes of the furnace, were immediately lighted. The two figures of dough already mentioned appeared also on one of the altars. The fire was lighted about seven o'clock in the evening, amidst prayers, singing, and the noise of bells and musical instruments, which was sometimes interrupted by conversation between the lama and the bakschi, respecting some passages of the sacred books. The priests who kept guard were, in the mean time, strictly forbidden to suffer any person to peep in through the holes in the tent. Wood was continually thrust into the fire-holes; and the lama, by means of a ladle with a long handle, furnished at the fore part with small spouts, poured some of the grease which stood near him through the aperture upon the body, by which means the fire was so strengthened, that the flames rose, in a continued column, to the height of eighteen or twenty feet above the furnace. It was found necessary, therefore, to enlarge the aperture in the top of the tent, to prevent it from being destroyed. The gellongs, also, were soon obliged to stand so far back, that every thing which took place within the tent, or hut, could be plainly seen. At certain times the lama threw the bark of trees, daubed over with resin, and pieces of consecrated white silk, into the top of the furnace; and as he was exposed to great heat by standing so near it to pour the fat over the body, a screen was held constantly before his face by one of the gellongs, which secured him from the flames, but permitted him to see the aperture in the top of the furnace. The prayers offered up in the Tangut language, while the body was burning, became always longer, and were uttered with a louder tone of voice. They were intermixed with the ringing of bells, the clapping of hands, snapping of fingers, thrusting the fingers through each other, and then drawing them back, great contortion of the eyes and face, and various movements of the head.

This formidable fire was kept up for three hours, after which the furnace was suffered to stand some hours to cool. One can scarcely believe with what strength the fire was maintained, by the air which passed through the furnace, and the different aromatic substances which were thrown into it, prevented any disagreeable effect from the smoke, or the smell of the body. Next morning, when the furnace had cooled,

it was opened with great secrecy, under cover of the tent, and, the body, shrivelled like a mummy, being taken out, was divided in portions among the priests. Some of the poor people also, who were able to force their way through the crowd, obtained small bits of the little which was left. This burnt substance of the lama's body (*Lamain-Dishinder*) is considered, by the superstitious people, as a sacred medicine; and it may, therefore, be said, that the lama is gradually consumed by his own worshippers.

This mode of burning the body produces scarcely any ashes, as the skin, flesh, and bones, are so baked, by continually pouring fat over it, that the whole mass has the appearance of a cinder, and is equally friable. The few ashes, however, which remain, are carefully scraped together, with the ashes in the fire-holes, and are preserved by the priests. After the furnace was opened, it was entirely rased to the foundation, and not a single stone of it left. All the materials were carried in a cart to the other side of the Wolga, where the horde at that time resided. At the four corners of the spot, where the furnace had stood, high flags (*mani*) were erected; and, at the end of some weeks, when the horde returned to the district of Sarepta, a small stone chapel was constructed in the middle of the four flags, and filled in the inside with inscriptions, images, rags of old clothes, and the like, and surrounded by a ditch. This formed the conclusion of the whole ceremony.

OF THE LANGUAGE OF BIRDS.

IN general, it may be remarked, that every species of birds have peculiar modulations of voice, expressive of love, of pain, of anxiety, of anger, of complacency, and of good or bad fortune. These expressions, however, seem to be confined and intelligible to the individuals only of the same species. But there are certain sounds, particularly those of danger and of terror, which are perfectly understood, not only by the same species, but even by different genera and orders of birds. When the fox wishes to surprize birds in the neighbourhood of hedges, brushwood, or trees, he lies down on his belly, and extends his hind-legs, as if he were dead. In this situation, however, he is perfectly vigilant, and cunningly observes the motions of the birds along the hedges and trees. If any of them happen to spy him, they immediately send forth soft, mournful, but shrill, cries, to alarm their neighbours, and to advertise them of the enemy's approach. Blackbirds and jays have been frequently observed to follow the fox, flying from tree to tree, and often repeating the same cries of alarm and danger. These cries, by whatever birds they are uttered, are understood by every species within hearing, who instantly use all their arts of defence against the common enemy. Birds are well acquainted with their natural enemies, and this knowledge seems to be purely instinctive, and not derived from experience or observation. When they observe the pine-weasel, though for the first time, they utter the same mournful cry to announce his approach as when they see a fox. It is likewise worthy of remark, that birds utter this peculiar cry upon the appearance of all carnivorous animals, as the wolf, the fox, the pine-weasel, the cat, &c. but never against the stag, the roe, the hare, nor against man, who, of all animals, is the greatest destroyer of the inferior tribes.

The language of most birds is a musical language, and reducible, by a pitch-pipe, to a musical key. All species are not equally eloquent.

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The language of some species is copious and fluent, but that of others is confined to a few important sounds, which are necessary to express barely their feelings and their wants. But no bird, like the finny tribes, is perfectly mute. The language of birds, Mr. White, of Selbourne, remarks, is very ancient; and like other ancient languages, very elliptical. They say little, but much is meant and understood. Owls have a very expressive language. They hoot in a fine vocal sound, which has a considerable resemblance to the human voice. This note seems to express complacency; and sometimes rivalry among the males. They likewise use a quick call, and a horrible scream; and they snore and hiss, when they mean to threaten and intimidate. The note of the eagle-kind are shrill and piercing; and, in the season of love, very much diversified. Ravens, beside their loud croaks, sometimes exert a deep and solemn note, which makes the woods resound. The amorous sound of a crow is strange, and even somewhat ridiculous. In the breeding season, rooks make clumsy attempts towards singing. The parrot-kind possess a great range of modulation in their voice, as appears by the facility with which they learn to pronounce words, and even short sentences. The coo of the pigeon is amorous and mournful. When the male makes love, or is jealous of rivals, he erects his body, raises the feathers of his neck and head, and employs many strutting and lively gesticulations. To these movements he adds a guttural but not unpleasant kind of speech, which is soft and alluring when he means to solicit the female. When jealous of a rival, he utters the same notes, but gives them a more sharp, and even a menacing, tone. The woodpecker, when pleased, sets up a loud and hearty species of laugh. The goat-sucker, or fern owl, from the dusk till day-break, serenades his mate with sounds similar to the clattering of castanets. Most of the small birds, or passerines, express their complacency by sweet modulations, and a variety of melodious sounds. The swallow, by shrill alarm, rouses the attention of his species, and tells them that the hawk approaches. Gregarious and aquatic birds, especially those of the nocturnal kind, who shift their abodes in the dark, are extremely noisy and loquacious; as cranes, wild geese, wild ducks, &c. Their perpetual clamour prevents them from dispersing and losing their companions.

We shall now make a few observations on domestic fowls, whose language is best known, and, of course, best understood. The voice of the peacock, like those of many birds of the finest plumage, is harsh and grating. The braying of asses, or the yelling of cats, is not more disagreeable. The voice of the goose clanks and sounds somewhat like a trumpet; but the gander, especially when he apprehends danger to the younger brood, joined to his threatening aspect, and the movements of his neck, hisses in a manner so formidable as deters the too near approach of children and of small dogs. In the duck kind, the voices of the female and male are remarkably different. The quack of the female is loud and sonorous; but the voice of the drake is harsh, inward, and feeble. The cock turkey, when proud, or when addressing his mistress, blows up his wattles, erects his feathers, makes a humming noise by vibrating his wings, and utters a goblin kind of sound, which, though we cannot describe, is perfectly understood by his own species. When attacked by a boy, or any other adversary, he assumes a pert and petulant tone; and such is the obstinate courage he displays, that he will rather die than give up the contest. A hen turkey, when she leads forth her young brood, watches them with the utmost anxiety. If a hawk,

or any bird of prey, appear, though very high in the air, the careful and affectionate mother announces the enemy, with a low inward kind of moan. If he makes a nearer approach, her voice becomes earnest and alarming, and her outcries are redoubled both in loudness and frequency. The effects of this interesting eloquence upon the young are astonishing. They understand the intimidating language of the mother, though they know not the immediate cause of the danger; but, by the intuitive knowledge of the meaning of what she says to them, they instantly employ every artifice to conceal and protect themselves from the impending danger. To accomplish this purpose, they run under hedges, brushwood, and even the leaves of cabbages, and of such other plants as happen to be near them.

None of our domestic birds seem to possess such a variety of expression, and so copious a language, as common poultry. A chicken of four or five days old, when held up to a window frequented by flies, immediately seizes its prey, and utters little twitterings of complacency; but, if a bee or wasp is presented to it, its notes instantly become harsh, and expressive of disapprobation, and of a sense of danger. When a hen is about to lay an egg, she intimates her feelings by a joyous and soft note; but she has no sooner disburdened herself, than she rushes forth with a clamorous kind of joy, which the cock and the rest of his mistresses immediately adopt. This tumultuous noise is not confined to the family, or rather seraglio, but is transmitted from yard to yard, and spreads to every homestead within hearing, till at last the whole village is in an uproar. When a hen has hatched a brood, a new and interesting scene is exhibited. Her relation, as a mother, requires a new species of language. She then runs clucking and screaming about, and seems to be agitated with the greatest anxiety. When men or dogs suddenly approach her feeble brood, her courage and maternal care are astonishing. With loud cries, and rapid motions, she assails the enemy: neither a man, nor a lion, in those circumstances, are sufficient to repress the courage of this unarmed bird. I have seen a hen, when attending her young, boldly attack, intimidate, and beat off, a mastiff. The vocabulary of the cock is likewise pretty extensive; and his generosity and gallantry are remarkable: when he discovers a quantity of food, instead of devouring it himself, he instantly calls to his concubines to partake of the repast; and, if he discerns a bird of prey, or any other alarming danger, with a warning voice, he desires his family to be on their guard against the common enemy. The cock has also at command his love speeches; and his terms of defiance. But his most peculiar sound is his crowing, by which, in all ages, he has distinguished himself as the countryman's clock, as the watchman who proclaims the divisions of the night.

On the subject of our common poultry, we must not omit a curious fact, recorded by that intelligent naturalist the Rev. Mr. White, of Selbourne. A neighbouring gentleman had, one summer, lost most of his chickens by the depredations of a sparrow-hawk, that was in the practice of gliding down between a pile of faggots, and the end of his house; to the place where the hen-coops stood.

The owner, exasperated to see his flock daily diminishing, hung a setting-net between the house and the pile, into which the unwary robber dashed, and was entangled. Resentment suggested retaliation: he, therefore, clipped the wings of the hawk, cut off his talons, and, after fixing a cork on his bill, threw him down among the brood-hens. Imagination,

gination, Mr. White says, cannot paint the scene that ensued. The expressions excited by fear, anger, and resentment, were strange and interesting. The enraged matrons upbraided, execrated, insulted, and, at last, triumphed over, the helpless victim; they never desisted from buffeting their adversary till they had torn him in pieces.

One very singular observation remains to be made. Contrary to what almost universally takes place in the human species, the females of the inferior animals are not so loquacious as the males. This remarkable difference, if we scrutinize impartially the intentions of nature, will be found, like all other intentions, to be productive of the wisest and most beneficent purposes. Among these brute animals who pair or marry by mutual selection, and particularly almost the whole of the feathered tribes, when not corrupted by domestication, the language of the males is more extensive and more frequently repeated, than that of the females. It is for this reason, that, in purchasing singing birds, great attention is paid to those characters which distinguish the males from the females, the latter being considered as comparatively mute and useless. When the female thrush, or blackbird, is brooding over her eggs, the male sits upon a neighbouring tree; and, when no danger appears, he tells her, in melodious and encouraging strains, not to be afraid, because he is keeping the strictest watch. But, when he perceives the too near approach of men, of birds of prey, or of any other rapacious animals, he instantly changes his addresses to her. Instead of his former soothing notes, he flies from branch to branch, or from tree to tree, uttering dismal, alarming, and harsh, cries. In this manner he tells her to beware of the enemy. When the danger is greatly increased, by a still nearer approach, the male again changes his language: he then, by quick and precipitate sounds, commands her to fly, and to save herself, even in preference to her eggs or her defenceless brood.

Here the intentions of nature, as well as the necessity of a varied though limited language, are evident both to our ears and eyes; for, on such occasions, the sounds are uniformly accompanied with the most expressive gestures. When boys are about to carry off a nest of young birds, both parents, notwithstanding their natural dread of man, which is too often augmented by cruelty, make a much nearer approach than at any other time.

Their almost invincible attachment to their offspring seems, in a great measure, to deprive them of the principle of self-preservation. Their cries are low, mournful, and not unfrequently resemble those uttered by human beings when placed in similar circumstances. But when despair removes all hope, another change of language is exhibited. Both parents then fly round the assailant, screaming and uttering threatening cries; and sometimes they even attempt to repel the spoiler.

When a boy, says Dr. Smellie, I carried off a nest of young sparrows, about a mile from my place of residence. After the nest was completely removed, and while I was marching home with them in triumph, I perceived, with some degree of astonishment, both parents following me, at some distance, and observing my motions in perfect silence. A thought then struck me, that they might follow me home, and feed the young according to their usual manner. When just entering the door, I held up the nest, and made the young utter the cry which is expressive of the desire of food. I immediately put the nest and the young in the corner of a wire-case, and placed it on the outside of a window. I chose a situation in the room, where I could perceive

ceive all that should happen, without myself being seen. The young animals soon cried for food. In a short time, both parents, who understood the language as well as the peculiar voices of their mutual offspring, having their bills filled with small caterpillars, resorted to the cage, and, after chattering a little, as we would do with a friend through the lattice of a prison, gave a small worm to each individual. This parental intercourse continued regularly for some time, till the young were completely fledged, and had acquired a considerable degree of strength. I then took one of the strongest of them, and placed him on the outside of the cage, in order to observe the conduct of the parents after one of their offspring was emancipated. In a few minutes, both parents arrived, loaded, as usual, with food. They no sooner perceived that one of their children had escaped from prison, than they fluttered about and made a thousand noisy demonstrations of joy, both with their wings and their voices. These tumultuous expressions of unexpected happiness at last gave place to a more calm and soothing conversation. By their voices and their movements, it was evident that they earnestly entreated him to follow them, and to fly from his present dangerous state. He seemed to be impatient to obey their mandates; but, by his gestures and the feeble sounds he uttered, he plainly told them that he was afraid to try an exertion he had never before attempted. They, however, incessantly repeated their solicitations; by flying alternately from the cage to a neighbouring chimney-top, they endeavoured to shew him how easy the journey was to be accomplished. He, at last, committed himself to the air, and landed in safety. Upon his arrival, another scene of clamorous and active joy was exhibited. Next day I repeated the same experiment, by exposing another of the young on the top of the cage. I observed the same conduct with regard to the remainder of the brood, which consisted of four. I need hardly add, that not one, either of the parents or children, ever afterwards revisited the execrated cage.

We have already seen, and every body knows, that, in general, the males of the inferior animals are more loquacious than the females. But, in the human species, it is likewise an unquestionable fact, that the females are much more talkative than the males. It is even remarkable, that female children, though of the same family, and receiving the same instructions and example, acquire the faculty of speaking sooner than the males.

We shall now endeavour to investigate the intentions of nature in creating such a marked distinction.

In all ages, and in all the regions of the earth, the early education and management of children have necessarily devolved upon the mothers. For this important task, they are much better qualified, both in the structure of their bodies, and in the dispositions of their minds, than the males. The connexion between the mother and child begins long before it becomes an object of attention to the father. By a thousand circumstances, which mothers only know, and sometimes attempt, though obscurely, to describe, they contract an affection for a still invisible being. After the child is ushered into the world, the curiosity and the sympathetic joy of the father are excited. He, accordingly, exerts himself to render the condition both of the mother and child as happy as possible. To support the child with a mild but nutritive food, secreted from the blood and other juices of the mother, Nature has provided her with a wonderfully complicated system of vessels, or lacteal pipes, which all

terminate in the nipples of her breast. To these nipples the infants instinctively apply their mouths, and, by suction, create a vacuum. The pressure of the external air upon the breast, or collection of tubes filled with milk, forces them to discharge their contents into the mouth of the child, who continues to swallow it till its stomach is satisfied. During this tender and precarious state of existence, the anxious and persevering attention of the mother, makes her cheerfully endure many toils and hardships, under which she would often sink, were she not, on such occasions, almost preternaturally supported by mere strength of affection.

After the child has arrived at the age of two or three months, and, in strong and healthy children, much earlier, or as soon as it is capable of giving a transient attention to particular objects, then the exertions of the mother are almost perpetual. Her sole object is to please by little amusements, which she endeavours to accommodate to the weak but gradually augmenting capacity of the infant. The chief instruments which she addresses are the eyes and ears. To the eye she presents shining or luminous objects, with which children are very early delighted: and, at the same time, repeatedly mentions the names of the particular objects. Thus, by habit, the natural volubility of female tongues is greatly improved. I have often been amazed at the dexterity and quickness of mothers and nurses, when endeavouring to please fretful children. They hurry the child from object to object, in order to discover if any of them arrests its eye. If this attempt does not succeed, they have recourse to other expedients. The ears of all infants are delighted with any loud noise. The mother, who wishes to appease the fretfulness, or even to keep up the spirit and cheerfulness of the child, tosses it about in her arms, sings, and talks alternately; and, on such occasions, it is astonishing to observe the quickness of her transitions from one species of incomprehensible jargon to another. Still, however, she goes on, either rattling with her tongue, or making a rattling noise on tables, chairs, &c. A person who had never attended to these scenes, which are so often exhibited by a sprightly mother and a sprightly child, would be apt to conclude, that both were proper inmates for a bedlam. These are well known to be universal facts; and we shall now endeavour to shew their utility.

It is a very ancient adage, that "Nature does nothing in vain." To women she has given the talent of talking more frequently, as well as more fluently, than men; she has likewise endowed them with a greater quantity of animation, or what is commonly called animal spirits. Why, it may be asked, has Nature, in this article, so eminently distinguished women from men? For the best and wisest of purposes. The principal destination of all women is to be mothers; hence some qualities peculiar to such a destination must necessarily have been bestowed upon them. These qualities are numerous: a superior degree of patience, of affection, of minute, but useful attention, joined to a faculty of almost incessant speaking.

Here, however, I must confine my observations to the last conspicuous and eminent accomplishment. To be occupied with laborious offices, which demand either bodily or mental exertions, and not unfrequently both, is allotted to the men. These causes, beside their comparative natural taciturnity, totally incapacitates them for that loquacity which is requisite for amusing and teaching young children to speak. But the employments of women are of a more domestic kind; household affairs, and particularly the nursing and training of children, are fully
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sufficient to engross their attention, and to call forth all their ingenuity and active powers. The loquacity of women is too often considered, by poets, historians, and by unthinking men, as a reproach upon the sex. Men of this description know not what they say. When they blame women for speaking much, they blame Nature for one of her wisest institutions. Women speak much. They ought to speak much. Nature compels them to speak much: and, when they do so, they are complying religiously with one of her most sacred and useful laws. It may be said, that some men talk as much as women;—granted. But beings of this kind I deny to be men. Nature seems to have originally made them to be women; but, by some cross-accident, as happens in the production of monsters, the external male form has been superinduced upon a female stock!

ON THE ORIGIN AND PROGRESS OF NAVIGATION.

ON the Mediterranean, navigation, first discovered in Phœnicia, the parent of Carthage, was soon adopted in Egypt. As to the materials and structure of the instruments afterwards, there seems to have been, however, a very wide difference. The original boats in Phœnicia, appear to have been made of single trees. Posterior to rafts, on the Nile, we learn from Pliny, that, in subsequent times they were formed of the papyrus, rushes, and reeds. The invention of open vessels is ascribed to the Phœnicians, and the addition of the deck is given to Egypt.

From Egypt, this art, being thus improved, passed with Danaus into Argos, in Greece, to which he went, about 1476 years before the Christian æra. There the vessels are all represented to have been of a round shape, till the building of the famous ship *Argo*, in the city of Argos, by Jason, for the expedition to Colchis, in search of the Golden Fleece. It was the first *navis longa* among the Greeks. But it gives us a poor opinion of their power and grandeur at that time; to find that the Argonauts were able to carry this wonderful and highly celebrated ship, afterwards so long preserved with veneration, consecrated to Neptune, translated to heaven, and placed, as a constellation, among the stars, on their shoulders, from the Danube to the Adriatic sea.

After rafts, and the trunks of trees scooped into boats, as mentioned by Virgil in the *Georgics*, the Roman vessels, from being unable to procure trees at all times, of sufficient bulk, were at first made of clumsy boards joined together. A Carthaginian ship, stranded on the coast of Italy, was the earliest cause of any considerable improvement in their naval architecture; but they made no figure at sea till the first Punic war.

Their ships of war were long, and managed chiefly with oars; those of burden were rounder, and driven by the wind.

Though, without much probability, the ancients, according to Goguet, ascribed to the fins of fishes, and the tails of birds, the application of oars, and the helm; to the first of which he, himself, assigns the origin of them both, as well as of the sail. The invention of the sail, however, in its rudest state, made of skins, is given to Æolus, and Dædalus the famous Athenian artist; but from whence the thought was produced, that gave rise to the first boat, or sail, seems neither to have been investigated nor plausibly conjectured by any author of antiquity.

The bark-logs of the native barbarians of Puerto Seguro, in California, when visited by Captain Woodes Rogers, seem to have been almost precisely the squirrel's bark in its primitive state, as pointed out by nature, through

through the vehicle of that sprightly and engaging animal. As also the Balza-logs, with one oar, of those about the west coast of Terra Firma, used in fishing mantas, as described in Don Ulloa's Voyage to South America.

In some cases, the boats of savages were actually and literally made of bark; as among the Indians, on Terra del Fuego. In New South Wales, the huts were "covered with pieces of bark and palm leaves." In New Zealand, they were "made of the bark of trees." In other places on the Pacific Ocean, their cloathing and sails, sometimes manufactured coarsely into mats, were of bark; and, both about the Spanish presidency of Monterey, on the north-west side of America and Tchoka, on the north-east side of Asia, off the coast of Tartary, from the account of M. de la Peyrouse's voyage round the world, lately published, it appears that in 1786 and 1787, not only garments, but even the domestic vessels, were of the same material.

The earliest attempts at navigation, agreeably to the opinion of President Goguet, seem to have been made in crossing of rivers; though, even before the time of Noah, men had probably ventured on the sea, since we find, that, by the grandsons of Japhet, "the isles of the Gentiles were divided in their lands." Gen. x. 5.

Where the bark happened to be unfit for the purpose, the practicability of the art being now made evident, it was natural, by some means, to endeavour to supply its place.

Trees laid across each other, bound with twigs, and covered with their branches and heath, presented an obvious and striking substitute. If pines or firs were used, with their straight stems, and tough subdivided branches closely matted with evergreen leaves, they would, by a thought likely to present itself, with little contrivance, or labour, on the banks of rivers where woods are commonly found, produce at once, on a large scale, both the uses and appearance of the squirrel's bark. One of the lightest of the trees would serve for a pole and a rudder, and another, with a skin tied across it, for a mast and a sail. Before Danaus introduced navigation into Greece, according to Pliny, (l. 7. c. 56.) the Egyptians used rafts, which he says were invented by King Erythras, for visiting the islands in the Erythraean (Red) Sea. Erythras was the son of Perseus and Andromeda, was drowned in the sea, probably from one of his floats, and from thence it got his name.

The sailing balzas, or rafts made of the wood balza or puero, supposed to be the ferula of Columella, and used on the river Guiaquil, in Peru; instead of rudders, are managed by gueras or boards placed vertically, both in the head and stern, so as to be thrust deeper or shallower at pleasure; and are so large as to transport whole families to their fishing stations, with their bongoes or canoes, made from a hollowed trunk, their rude articles of furniture, and their harpoons and tackle for fishing with.

Another mode of supplying the want of suitable bark was by having recourse to the tree itself. When employed about the bark, on its failure, the transition was easy to the trunk from which it was taken. It would evidently appear, that, by fire or tools it might be scooped out, so as to resemble it, and, with the addition of much greater strength and durability, be made to answer the same purpose.

Without the intervention of any thing to copy from, or of rafts, Sir Walter Raleigh says, "the West Indians, and many nations of the Africans, finding means and materials, have been taught by their own necessities

necessities to pass rivers in a boat of one tree." From the few things carried about with them, and their dexterity in swimming, however, the necessities of a savage, that cannot be supplied without a boat, or even a raft, do not seem at first to be very obvious. Dryden conjectures that

Some log, perhaps, upon the waters swam,

An useless drift, which rudely cut within,

And hollow'd, first a floating trough became,

And cross some riv'let passage did begin.

But who should ever think of setting about hollowing a log, and labour it into "a floating trough," in order to get over a rivulet! Or what rivulet could swim a log large enough for such a purpose? It is said, though not very credibly, that Ousous, one of the most ancient heroes of Phœnicia, having met with a half-burnt tree, lopt off its branches, and, in this vehicle, was the first that had the boldness to trust himself on the water. By as likely a suggestion from such an occurrence, it might be alleged, that a savage chief on the western coast of New Holland, having pruned his tree, hollowed out by fire for shelter, as there still practised when lately visited by Captain Vancouver, and placed a rude door as a barricade to its front, was the first that gave a beginning, in like manner, to civil architecture; which, from thence along the intermediate islands, passed through Asia into the north of Europe, and into Greece, where it was improved and enriched by the elegant orders in which it now appears; that these, as well as the trough boat, were all pointed out by the original tree; its trunk being the shaft, and its top giving the capital to the different columns, by which, both the Gothic, and this more graceful and refined, though less awful and romantic, style of architecture is distinguished. Or, which is still more terrible, that the living-cells, now to be met with in New Holland, gave their hints on the spot; being, at an equally early period of society, to be found in Persia, Palestine, where the temple of Solomon was built, Egypt, Asia Minor, Europe, and Greece itself. But, however this may be, nothing is more probable than that, in common with the scooped-out boat, the ornaments of the eastern, Grecian, and Gothic, architectures, sprang from a tree; of which that called a pastoral column is an exact imitation; so that both civil and naval architecture seem to have the same Sylvian origin. The tree-pillar, and colonnade, at one time or other every where, were seen, to much advantage, in their pristine state, in 1787, in Maouna, one of the navigator's isles in the South Sea, by M. de la Peyrouse. Boats formed of hollowed trees, sometimes of alders, were called, *alvei*, *lintres*, *monoxyla*, *scaphæ*, by the ancients, and seem to have been common. "*Germaniæ prædones*, (Pliny observes, l. 16.) c. 40. *singulis arboribus cavatis navigant, quarum quædam et triginta homines ferunt.*" The same was the practice among the ancient Britons, their descendants, amongst whom the first attempts in navigation evidently originated from the obstacles which rivers threw in their way. The component parts of the word, signifying a boat, in the Gaelic, is a sufficient proof of these facts. This appears from the first volume of the Transactions of the Highland Society of Scotland, just published, p. 342, where it is mentioned that *biorlinn*, compounded of *bior* a stick, and *linne* the still water of a river, "which signifies a boat," in the Gaelic language, "points out the origin of navigation, in a very remote period of society, when the ingenuity of man had proceeded no farther than to hollow out a piece of wood, in which he could barely venture to cross over the unruffled pool of a narrow river." From Cook's voyages, and

and that of M. de la Peyrouse, we learn, that vessels scooped out of solid wood, frequently of a species of spruce fir, were general over all the Pacific Ocean, as well on the Asiatic as American side. From the voyage round the world, lately made by the *Discovery* and *Chatham*, it seems, with others, that such are in use among the savages about Cape Orford, on the north-west coast of America. "Their canoes, 24th April, 1792," says the writer of the journal, "were rudely hollowed, each from the trunk of a single tree, of capaciousness sufficient to bear eight persons, but unfit for going far out to sea. Their garments were of skins of deer, bears, foxes, or river-otters." And, from the accounts of Columbus, and Sir Walter Raleigh, they prevailed as much, in their times, on the opposite shores of the Atlantic; in the West Indies, as well as in Africa.

That the primitive sail, as formerly taken notice of, consisted of a skin, is confirmed by Cæsar's account of the Veneti, in Gaul; (B. G. l. 3. 13.) who continued to use skins for sails even in his time. Also from the history of Captain Cook's second voyage; which, in describing the miserable inhabitants of Terra del Fuego, in the very lowest state of society, 25th December, 1774, represents their clothing to be a seal's skin, scarcely covering their shoulders; their weapons to be bows and arrows, and harpoons made of bone, fitted to a staff; their canoes to be of bark; and adds, that "they likewise carry in their canoes large seal-skins, to shelter them when at sea, and to serve as covering to their huts, on shore; and occasionally to be used for sails." The journal farther remarks, that of all the nations this celebrated navigator has seen, "these people seem to be the most wretched."

When trees sufficiently large could not be got, the obvious and almost only way of increasing the depth and width of a boat, was to choose out smaller ones, with a proper bend; hew them down to its thickness, and fix them round its edge. From the journal of M. de la Peyrouse, we find, with the addition of a covering of skins, that accordingly this mode is adopted by the Indians about Port de François, on the north-west coast of America, in the formation of their canoes. In Portland island, in the South Sea, in 1769, Captain Cook, in the *Endeavour*, met with a canoe, where the bottom consisted of three trunks of trees joined together; those of another island, he saw soon after, being in their original state, "formed of the trunks of single trees, made hollow by burning; not carved, nor in any shape ornamented."

After boards had, in this manner, been introduced, the original trunk dwindled down to a keel; and, the first advance in this new mode, of omitting the trouble of hollowing the tree, seems to have been, as in the Ekes, by using only two pieces, one for each side; added to the keel, and joined at their extremities. Such were the flying proas of the Marianne islands, "the body of the proa being formed of two pieces joined endways, and sewed together with bark," as described in Lord Anson's voyage. Such also were the canoes of New Zealand, seen by Captain Cook in 1770, which were steered by two men, having each a paddle, sitting in the stern, and of which "each side was formed of one entire plank, about 12 inches broad, and about an inch and a half thick, fitted to the bottom part with equal strength and ingenuity."

Beyond this, the constructing a boat of rows of additional planks, closely united, one above another, from the keel to the gunwale, was but a short step, and thus far only the Romans seem to have come; for till then they had no ships, when the Carthaginian vessel was stranded on their coast.

In some places another thought very generally arose about the same time with the hollowed tree; either from the scarcity of wood, or from the occupations of such nations as were commonly employed in hunting and fishing. They formed their boats of bent branches with basket-work; and, instead of planks, covered them with the skins of land animals or seals. This mode was besides attended with this obvious advantage, that, being lighter than boards, and more easily applied, it rendered them more suitable to their wandering lives and employments. They could carry them over land from one river or lake to another, and the materials of which they were constructed were furnished by their occupations. Doubtless, for similar reasons, the tents or cabins used by the Indians, on the west coast of Hudson's Bay, as mentioned in Mr. Ellis's voyage for the discovery of a north-west passage, were formed in the same manner, being "covered with morse and deer skins sewed together;" as were also their bodies, with those of the "deer, otter, and beaver." Besides those of the Ekimaux, and other rude nations, of this kind the boats of the ancient Britons are described to have been by Cæsar and Pliny.

Lord Kames, in his *Sketches of the History of Man*, advances the following, though unsupported, theory on this subject, with much confidence: "With respect to naval architecture, the first vessels were beams joined together, and covered with planks, pushed along with poles, in shallow water, and in deep water drawn by animals on the shore. To these succeeded trunks of trees cut hollow, termed by the Greeks monoxyles. The next were planks joined together in form of a monoxyle. The thought of imitating a fish advanced naval architecture. A prow was constructed in imitation of the head, a stern, with a moveable helm, in imitation of the tail, and oars in imitation of the fins: sails were at last added, which invention was so early, that the contriver is unknown." To some, however, it may not, without evidence, be altogether clear, that men, in so barbarous a state as not even to have trunk boats, but only "beams joined together, and covered with planks;" should have tackle, proper side tracks, as on a Dutch canal, and domesticated animals trained to the draught, so as that "in deep water" these rafts, here called "vessels," should be "drawn by animals on the shore." Neither is it obvious, that before the invention of sails, the "contriver" of which Dædalus, at least among the Greeks, is not "unknown," "the thought of imitating a fish advanced naval architecture." For the first boats on the Mediterranean are said to have been round; and all the accounts we have of the many savage nations in the world, even of those acquainted with the use of sails, from the time of Columbus to that of Captain Vancouver in 1795, represent the shape of their vessels, with the methods of steering and paddling, as altogether different from the appearance and management of the body, tail, or fins, of any fish that swims; with those figures, or operations, even were those of their fins, when in the water, conspicuous, any farther than as articles of food, they probably never thought it concerned them to take up their attention. The conceit, in the latter part of this theory, is notwithstanding repeated from the opinions both of the ancients, and of M. le President de Goguet; which makes it the more remarkable, as having passed, unchallenged, through so much genius and discernment.

If we either choose, in this instance, to throw off the fetters of antiquity; or, disdaining to lie under an obligation to an inferior animal, to have recourse to accident, altogether unassisted by imitation; the most plausible account, from the various facts of which we have received dis-

trist information, of the rise and progressive beginnings of this astonishing art, is, perhaps, the following one.

The first attempts at navigation seem evidently to have been made for the purpose of crossing rivers, or, perhaps, of landing on a neighbouring island from the border of a lake. As it is on the banks of rivers and lakes that woods are chiefly to be met with, it would frequently happen that trees and branches, sometimes lying across each other, and entangled and covered with twigs, and matted with leaves, would be carried down the stream, almost every flood, till they were either launched into a lake, or lost in the sea. It is to such situations, likewise, as the warmest, and most convenient for hunting, fowling, and fishing, that men usually resort. But no sooner had a savage from his hut observed one of these natural rafts drifting along; and, from curiosity, or some other motive, had overtaken it by swimming; or had stopped it whilst caught by a rock, or whilst lingering on a pool; than he would immediately find, that by means of one of the lightest of the trees, used as a pole, he could not only avoid the necessity of swimming from one side of the river to the other, but could transport, with much more ease, on such a vehicle, both his weapons over the river, and his spoils on returning. Also that he could fish more successfully when thus carried about, than when confined to the shore. These natural rafts are the floating islands of which there are so many fabulous traditions, from the wish to excite surprize, and a love for the marvellous, especially among those of an unimproved state. around every lake, which has wood on its borders, or on the banks of the streams by which it is fed. Climbing plants, such as the vine or the honeysuckle, would bind the copies of these natural rafts together; twigs, leaves, and heath, or skins, would furnish floors; and young pines, or firs, would make excellent poles for pushing them forward. When Lord Kames supposed the first rafts were laid with planks, he was certainly thinking of people in a more civilized state than those of whom he was writing.—As it would often happen, with such rude bindings, that the pieces, of which these primitive rafts were composed, would not be very strongly united, the whole platform would, in spite of every effort to keep it together, from various causes, in numberless instances, fly asunder, separate, and disperse. On meeting with such an accident, the pilot would naturally keep by one of the largest of the beams, and endeavour, with his pole, to support himself upon it, independent of the rest. That this is agreeable to fact, is evident from the account of Don Ulloa's voyage to South America. "The vessels used upon this river (Guiaquil)," says the writer, "are charas, canoes, and balzas, or rafts, a name which sufficiently explains their construction, but not the method of managing them, which these Indians, strangers to arts and sciences, have learned from necessity."

These balzas, called by the Indians jangadas, are composed of five, seven, or nine, beams, of a sort of wood, which, though known here only by the name of balza, the Indians of Daren call puero; and, in all appearance, is the ferula of the Latins, mentioned by Collumella. It is a whitish soft wood, and so very light, that a boy can easily carry a log of it, three or four yards in length, and a foot in diameter. These beams are fastened, or lashed together, by bijucos, and so securely, that with the cross pieces at each end, which are also lashed with all possible strength, they resist the rapidity of the currents, in their voyages to the coasts of Tumbez and Paita. The Indians are so skilful in securing them, that they never loosen, notwithstanding the continual agitation; though,

though, by their neglect in examining the condition of the *bujacos*, whether they are not rotten or worn, so as to require others, there are some melancholy instances of *balzas*, which, in bad weather, have separated, and by that means the cargo lost, and the passengers drowned. With regard to the Indians, they never fail of getting upon one of the beams, which is sufficient for them to make their way to the next port.

From such occurrences, and involuntary experiments, finding it thus practicable to support and balance themselves upon a single beam, without the labour and materials requisite for constructing a compound raft; where it was unnecessary to transport articles of bulk from one place to another, and especially in fishing, when quickness of motion and conveyance was of importance; people gradually and naturally took to the single-tree raft, if it may so be called, with one oar; also used on the west side of the same continent, in the bay of Manta, not far distant from Guayaquil. The one oar seems to have been nothing else, as indeed oars are to this day, but the original pole, flattened at one end, to catch the water, and used as a paddle.

"The bay of Manta," says the same account, "was formerly remarkable for a considerable pearl-fishery, but it has been discontinued for some time," previous to the 9th March, 1736, "the inhabitants not having ability to purchase negroes for carrying on this fishery. The bay has probably its name from the great quantity of mantas in those parts, the Indian inhabitants being generally employed in taking that fish, which they salt and carry to the inland provinces. The Europeans cannot help admiring their dexterity in this kind of fishery, which they carry on in the following manner: they throw into the water a log of wood, such as they use in making a *balza*, being about five or six yards in length, and near a foot in diameter. This log will be sufficient to support the weight intended, which consists of a net lying across one end of it; and, the Indian, standing in an erect position, on the other. On this tottering vessel, assisted by only a single oar, he puts off to sea, about the distance of half a league, where he shoots his net. Another Indian follows him on a similar log, takes hold of the rope, fastened to one end of the net, by which means the whole is expanded, and both the Indians move towards the land, where their partners wait to draw the net on shore. In this occupation the dexterity and agility of the Indians, in maintaining an equilibrium on round logs, is truly amazing; for the continual agitation of the sea renders it absolutely necessary for them to be continually changing their position, and making different motions with their bodies; and what still heightens the difficulty is, that the Indian is at the same time obliged to mind both his oar and his net, in drawing it towards the land. They do indeed sometimes, though very seldom, slip off their logs; but, being excellent swimmers, they recover their bark, and, in an instant, place themselves in their former posture."

Such were also the bark-logs seen on the coast of California by Captain Woodes Rogers, of which the following short account is given:

"They left the island of Tres Marias on the 25th of October, 1709, and steering to the north, on the 26th sent the bark on the shore of Puerto Seguro, in California, in search of water. The men saw some Indians, who paddled to them on bark-logs, but were at first afraid of coming up to them; but, being prevailed on to accept a knife or two, and some baize, they gave them in return a couple of live foxes, a deer-skin, and two bladders of water.

On the 29th, some of the crew ventured on shore on bark-logs; for the sea was so high they did not dare to attempt landing with their boats. Upon this occasion, the good-natured Indians leaped into the sea to guide the bark-logs; and, on their getting ashore, the Indians led each of the English up the bank, where was an old man, who had a deer skin spread upon the ground, on which they kneeled before the English, who followed their example, and kneeled too; the Indians then wiped the water off the faces of the English with their hands. The ceremony being ended, each of the sailors, supported by two of the natives, was led slowly through a narrow path to their huts, where they were welcomed by a very dull kind of music.

The men were naked, and the women have only a short petticoat, made of silk-grass, deer-skins, or those of pelicans, which do not reach to the knee; some of them wear pearls about their necks, having first notched them round, and fastened them with a string of silk-grass. The men are straight and well limbed, live by fishing and hunting, and have a greater value for European knives, scissars, and nails, than for gold and silver. They have long black hair, and are of a dark brown complexion. Their arms are bows and arrows, with which they are excellent marksmen, and will shoot a small bird flying. The women, who are far from being handsome, employ themselves in gathering and grinding grain on a stone, and in making of fishing lines. They are an honest people, would not take the least thing without leave, and were willing to assist the English in filling the water, and to supply them with whatever they would procure."

For the sake of extending their breadth, and of standing or sitting with greater ease, firmness, and safety, on these logs; they would soon come to be flattened on the upper side, and sharpened below with such instruments as were to be had; and also contracted to a point at each end, so as to be pushed either way, with less opposition, and more celerity.

The hollowing the upper side of the log, to prevent any article the hunter or fisher wished to carry with him, from falling over, now became an obvious and striking thought, arising of itself; and, by finding its capacity and convenience thus so astonishingly increased, would lead to the formation, by fire or tools, of the tree boat, wherever the beam or trunk was of sufficient size to admit of its being made into one; and, through it, as already traced, to that of vessels of a more complex structure. In Don Ulloa's satisfactory and entertaining narrative, we find, that, "the barks employed on the river Chagare, near Panama, in the Isthmus of Darien; between Guiaquil and Manta bay, where balzas and balza logs; and California, where bark-logs were used: "are of two kinds, the chatos and bongos. The former are like the European vessels, composed of several pieces of timber, but of a greater breadth, that they may draw but little water; they carry from seven to eight hundred quintals. The latter are formed out of one piece of wood, and it is astonishing to think there should be trees," from another place usually cedars, "of such a prodigious magnitude, some of them being eleven Paris feet broad, and carry conveniently four or five hundred quintals." And at cape Orford, in New Albion, on the other side of California, as already mentioned, Captain Vancouver, within these few years, found canoes "rudely hollowed, each from the trunk of a single tree." So that on the coasts and islands of the Pacific Ocean, from whence we have learned, especially when joined to that from the eastern side of the New Continent, more authentic and valuable information,

mation, as to the true appearances of mankind in a state of nature, than from all the fabulous and real accounts of antiquity combined; we have, at one view, the whole progress of navigation in its first stages: from the balzas or rafts on the river Guiaquil, in South America, perhaps coeval with those on the Nile, on the other side of the Atlantic, to the improvements on the trae boat, equally common on the Old Continent, observed by M. de la Peyrouse, about Port de François, almost at the opposite western extremity of North America.

In the course of navigation the original raft or log, when the pole was too short to reach any particular part of the bottom of the river or coast, the only possible way of acting upon it, and which would be followed without any previous contrivance, was by pressing the end of the pole, since it could not make the ground, against the water, and, by repeating these instinctive efforts as quickly as possible, to struggle or paddle it on, till the bottom was again within reach of the pole. This would show, that the raft, or log, could be impelled forward without the assistance of the ground, and would naturally lead to the flattening the extremity of the pole, that it might include more of the water in its breadth, and, by encreasing the opposition, be applied in directing it with the greater effect. This supercedes the necessity (as in the theory formerly alluded to) of furnishing savages with tackle, towing paths, as on an improved navigable canal, in a great commercial country, and domesticated "animals on the shore," with which to draw their rafts "in deep water;" and, is besides both consistent and agreeable to history. Almost the only use of water-carriages, to people in a rude state, and which seems first to have led to their adoption, is to remove the obstacles which rivers present, and not to go along, but to get over them; yet, in this very material case, "in deep water," as "animals on the shore," even where the banks were suitable for drawing, could be of no service, it is there entirely left to the reader's own ingenuity to find out what was to be done.

We are informed that the canoes on the South-Sea are brought to a point at both ends; either of which is the prow indiscriminately. The flattened pole is the single oar of the balza-log, on the west coast of South America, used when standing. This, when shortened for the accommodation of sitting, became the paddle of the bark-log at California, on the same side of North America; and of all the tree-boats and canoes constructed afterwards.

Paddles, thus arising out of the common course of incidents, and, as it were, appearing necessarily, and of themselves, were applied without any alteration of form both to the uses of the oar and the helm, "The Indians of these islands," the Ladrones, says the writer of Lord Anson's voyage, "are a strong, well-limbed, and bold, people, and, from some of their practices, seem to be no ways defective in understanding; for their flying proas, which for ages past have been the only vessels they have employed, are a very singular and extraordinary invention, and are said to be capable of running with a brisk trade-wind near 20 miles in an hour. The head and stern of the proa are exactly alike; but her two sides are very different. That intended to be always the lee side being flat, whilst the windward side is built rounding, in the manner of other vessels; but as her small breadth, and the straight run of her leeward-side would infallibly make her overfet, a frame is laid out to the windward, to the end of which is fastened a hollow log, formed like a small boat. The weight of the frame is designed to balance the proa; and the small boat,

boat, which is always in the water, to prevent her oversetting to windward. In short, the body of the proa is formed of two pieces joined endways, and sewed together with bark; for no iron is used in her construction. She is about two inches thick at the bottom, which at the gunwale is reduced to less than one. The proa generally carries six or seven Indians, two of whom are placed at the head and stern, who steer the vessel alternately with a paddle, according to the tack she goes on, he in the stern being the steersman. The other Indians are employed either in bailing out the water, which she accidentally ships, or in setting and trimming the sail. These vessels sail most excellently on a wind, and, with either end foremost, run from one of these islands to the other, and back again, only by shifting the sail, without ever putting about; and, by their small breadth, and the flatness of their lee side, are capable of lying much nearer the wind than any other vessel hitherto known."

The following account of the vessels of New Zealand, in 1770, is given in the journal of Captain Cook's first voyage.—"The canoes of this country are not unlike the whale-boats of New England, being long and narrow. The larger sort seem to be built for war, and will hold from thirty to one hundred men. One of these, at Tolaga, measured near seventy feet in length, six in width, and four in depth. It was sharp at the bottom, and consisted of three lengths, about two or three inches thick, and tied firmly together with strong plaiting, each side was formed of one entire plank, about twelve inches broad, and about one and a half inches thick, which were fitted to the bottom, with equal strength and ingenuity. Several thwarts were laid from one side to the other, to which they were securely fastened, in order to strengthen the whole.

"These vessels are rowed with a kind of paddles, between five and six feet in length, the blade of which is a long oval, gradually decreasing till it reaches the handle; and the velocity with which they row with these paddles is really surprising. The vessels are steered by two men, having each a paddle, and sitting in the stern; but they can only sail before the wind, in which direction they move with considerable swiftness.

"These Indians use axes, adzes, and chisels, with which last they likewise bore holes. The chisels are made of jasper, or of the bone of a man's arm; and their axes and adzes of a hard black stone. They use their small jasper tools till they are blunted, and then throw them away, having no instrument to sharpen them with.

"Their warlike weapons are spears, darts, battle-axes, and the patoo-patoo."

Besides shewing that at first there was no such thing as a rudder, distinct from a paddle; the structure of these vessels tends likewise to prove the futility of the fancy so long implicitly followed, that, "the thought of imitating a fish advanced naval architecture;" to which neither of them have the most distant resemblance. The "sides" of the proa are "very different" from each other; the head and the stern are "exactly alike," sailing equally well, either end foremost; and they have two steerers, one at each extremity, who, over its sides, steer the vessel "alternately," with a "paddle;" whilst the New Zealand canoes are steered by two men, having each a paddle, sitting both in the stern. In a somewhat similar manner were probably navigated the primitive hollowed boats in other parts of the world, without a helm.

When the paddlers were fatigued, or wished to relieve their arms, the only way of doing so was to rest the shaft of the paddle on the edge
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of the boat, so as throw on it part of the weight, and ease the exertion. In the course of repeating this it would soon appear, that by trusting it entirely to the side of the vessel, the arms would both be freed of the unnecessary load of the paddle, and would thus be enabled to apply their whole strength towards accelerating the motion of the canoe. On finding this, the making a notch in the gunwale for the handle to lie across, and pulling in an opposite direction, with the face looking aft, was all that was requisite to convert a paddle into an oar.

The steering paddle, likewise, being, from weakness or indolence, rested over the stern, and managed in the same way as when we still frequently direct a cock-boat, or sculler, with one oar, or when we make it simply a substitute for a rudder, in steering a yawl, soon got a crook in the handle, that it might be held easily when sitting, without raising the blade out of the water; and, being hung by thong loops, on a couple of pegs, to prevent it from shifting, became insensibly a distinct appendage to a vessel, under the name of a helm.

After these improvements, it being discovered that a row-boat, if long, has a sort of resemblance to some kinds of fishes; frequently seen near it, and connected with the same element; the notion that its form and management was furnished by them at first, was at once inconsiderately adopted, and, has since, no doubt, from the supposed infallibility of the ancients, being boldly repeated; although the fins of fish in water are so far from being likely to strike the attention of a savage, that they are scarce visible, or their movements discoverable, on close inspection. The tail was likewise so far from having any connection with the origin of the rudder, that the balzas or primitive rafts were managed, instead of a helm, by boards placed vertically at the head as well as the stern, and pushed deeper or shallower, as circumstances required, like the paddles used, subsequently, by the pilots at the extremities of a canoe.

Excluding the shorter process of direct imitation; the gradual discovery of the sail, without any great effort of genius, worthy, either of an *Æolus* or a *Dædalus*, or of a search into another element for the dorsal fin of a fish, as *Mr. le President de Goguet* supposes requisite, may apparently be traced with equal congruity. A man would hardly have begun to push along his new acquisition of the raft over a pool beyond his own depth, when, in the course of standing up to look about him, or whilst pausing for rest, he must have noticed, that the wind, acting upon his body, made the float glide forward in its own direction. On this being observed, if the wind blew favourably, his love of ease would soon show him that he might save himself the trouble of using his pole; and that the more he increased his bulk, the more wind he opposed, and the faster the raft moved. The means and material being at hand, the readiest way of increasing his size was by spreading out his skin mantle, so far as to form a kind of yard of his arms. This producing the desired effect, he would naturally endeavour to continue it, without the necessity of doing duty himself, and it would at once strike him, without much ingenuity, that his pole, or another like it, might supply the place of his body, and a branch fixed across it that of his arms, whilst a larger skin would collect more air than his mantle, and thongs would do for ropes and bindings. Hence, by degrees, would the most common occurrences lead to the sail, the yard, and the mast. When the wind opposed him, he would have recourse to his pole; and, when favourable, would indulge

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dulge himself with the luxury of rest, by hoisting his sail on his mast and yard; always kept erected, and ready to receive it. The primary rafts on the river Guiaquil, in Peru, supposed by the ingenious author of the Sketches of the History of Man, to be the first inhabited part of America, were managed by a sail.

The resemblance between the Guiaquil, and the Nile on the Old Continent, in several particulars, is curious and remarkable. The poor, untaught, scarcely human, natives of Terra del Fuego, carry in their canoes "large seal-skins," "occasionally to be used for sails." And even the vessels of New Zealand, in 1770, could "only sail before the wind." It is not, however, by any means clear that "sails were at last added," agreeable to the theory in the Sketches; since in the natural progress of such events as have been pictured, and were likely to give it birth, it may have been discovered prior to the oar and the helm, and only posterior to the raft and the pole.

These inquiries have imperceptibly extended themselves to a much greater length than was expected. They do not pretend to the discovery of the origin of navigation, but only by ascertaining the first appearances of the art, and delineating the various paths that have been followed, to endeavour to point out some others leading towards the fountain-head, attended with fewer obstacles and difficulties than any of the preceding ones. Like those into the place of Homer's birth, such investigations unquestionably derive much of their consequence from the importance of the subject with which they are connected. In making them, however, a person becomes interested in the authenticated histories of his own species in the earliest stages of society, and is unavoidably struck with the uniformity of the contrivances of mankind, in a state of nature, over the whole earth; however distant either in time or place, the different hordes, tribes, or nations, may be from each other. The log, the raft, the tree-boat, and bark sail;—the clay bark, and wicker hut, thatched with bark, leaves, or straw;—the bark or skin covering, for a part or all of the body;—the club; the spear sharpened at the extremity, and hardened by fire, or pointed with bone;—the bow, and arrows headed with flints;—the stone axe;—the fishing-hook of shell; where trees are fewer, and the climate colder, the skin hut, boat, sail, and cloathing;—and, in every situation where wood or flint is to be had, the production of fire, by friction or collision, are all so invariably adopted, that one is almost inclined to think, men, in a rude state, are led to these by instincts, similar to those of the inferior animals. Rafts sprang up equally on the Nile and the Guiaquil. Wherever trees are to be met with, even bows and arrows, trough-boats, and fires, produced by friction, though not the most apt inventions to occur to an uncultivated mind, are to be seen likewise; and the human race seem to be instigated to resort to them by a natural impulse, somewhat resembling that which directs the wonderful operations of the squirrel, the bee, or the beaver.

But, whether accident; invention, the offspring of necessity; instinct, or the imitation of instinct, has given rise to them; such were the rudiments, the small beginnings, of navigation! an art which has given a new character to the modern world, by which it has risen to an infinitely higher degree of civilization, ingenuity, and happiness; and, which has shielded the independence, and produced the super-eminent wealth and glory, of Great Britain in particular.

ESSAY ON LANDSCAPE GARDENING.

NATURAL taste is the foundation of all picturesque embellishment. To seize the grand outline with the mind's eye, to adapt the design to the predominant features in the landscape, to unfold the beauties of nature by the masterly touches of art, is the sublime province of the ornamental composer of rural scenery.

That this science has been cultivated with the greatest success in this country, even jealousy and national vanity will not pretend to deny. Foreign writers, distinguished for their taste, have allowed the English the pre-eminence in landscape and ornamental gardening; and that they were the first who emancipated themselves from the trammels of prejudice; and, recurring to Nature, which had long been banished from the seats of the great, invited her to her deserted abodes, and gave her a new and imposing aspect.

Kent saw the incongruity of artificial design. The straight walk, the clipped hedge, the tortured view, sunk beneath the superior chastity of his taste. He made as much progress as an innovator, who had a prevailing bad taste to contend with, could be expected to do. Perhaps his own was not quite correct. One age seldom unfolds an idea, and brings that idea to perfection. We have had schools of painting as well as of ornamental scenery. Some masters were distinguished for one excellence, and some for another. The force of genius has, at intervals, prevailed over disadvantages, and produced works to be admired, though not in every respect deserving imitation. Reynolds, with a mind enlightened by science, and chastised by taste, embodied the form, and caught the character, which he transfused into the colouring on the canvas. He grouped—he combined. He followed nature, and therefore succeeded; but he had great artists among his predecessors, who paved the way for the attainment of excellence.

It was not thus with picturesque embellishment. The science was comparatively new; and where attempts had been made, they were, in general, conducted on a wrong plan, or proceeded from a vitiated taste.

Kent had every obstacle in his way; yet he accomplished much; and gratitude is due to him who deviates from a wrong path, and aspires to perfection, though he may not reach her temple.

To Kent succeeded Brown—a man originally bred a gardener; and, from this fortuitous circumstance, without a particle of his genius, every person who can superintend a kitchen-garden, or handle a spade, has thought himself qualified to quit his sphere, and attempt design. But Brown possessed an originality of conception, a poet's eye, and an instinctive taste, for rural embellishment. He was at last animated and inspired by some of his own creations.

He saw the deformity of perverted beauty with keener optics than Kent—he viewed Nature with the enthusiasm of a lover; and though it cannot be denied, that he sometimes tricked her out in meretricious ornaments, and patched her with unmeaning clumps, he never lost sight of her prominent charms, and his worst errors are only like minute pimples on a beautiful face.

We have, however, seen this mighty master of picturesque embellishment severely censured by some of his own countrymen, who, indulging too much in the visions of theory, have denied him the merit of practical excellence. Because Brown could execute better than he could describe, and worked by self-taught rules, he has been attacked with

asperity; and some of his most capital performances have been ascribed to chance, or to a dereliction of his own principles.

But who can reduce the infinite variety of situations that are to be improved to any systematic principles? The powerful genius of a place will imperiously set rules at defiance; and, in fact, Art can only be the handmaid of Nature, whose beauties, presenting a boundless variety, are alike indignant of confinement and controul.

The attempt at system is only an effort to bring us back to what has justly been explored. I have no magical skill in planting roses, says Gray. Nature disdains the fetters of art. The best principles can never be universally applicable to all situations in an equal degree. The painter may invent or reject at pleasure, and adhere to the rules of his art: the embellisher of landscape is more confined in his operations; he cannot always reject—he can only improve. His invention may cover some defects; but it cannot always command the excellencies he might wish. Besides, a flat surface and an extended natural scene are very different materials to work on, and will have very different effects when viewed by the eye of natural taste, the only just criterion of rural embellishment.

The chef d'œuvre of Brown was the improvements at Blenheim. He had the noblest field to display his talents on, and he did not labour in vain. But, though he traced the outline with effect, the correct taste of the noble possessor of this magnificent place has enabled him to give it many additional touches, and to improve its drapery. He has, however, preserved the unity of the design, and only heightened the colouring. Who that now visits these picturesque scenes can deny, but that plantations have been applied to all the principal purposes which M. De Girardin, perhaps copying from his beloved Ermenonville, conceives ought to be their grand objects:

“To form the perspective or side-scenes of the fore-ground that may best connect the distances with the principal points of view. To raise such elevations or scenes as may give relief even to an absolute flat. To hide all disagreeable objects. To give more extent to those that are pleasing, by concealing their terminations behind a mass of wood; by which means the imagination continues them beyond the point where they are seen. To give an agreeable outline to all surfaces, whether of land or water.”

These are the ideas of a master; and we here see them realized. They who think justly, in matters not under the influence of passion, will generally think the same: hence often coincidence without intention. But, while Brown has been too indiscriminately condemned, he has also been too lavishly praised, where he is least defensible. His clumps must, in many cases, be given up by his most zealous partizans, or receive a degree of connexion by intermediate planting, as has been done at Blenheim, to preserve the uniformity of the scene. His unvarying circular belts too, where they are not broken into masses, as we see them here, and when they serve to exclude the prospect of the surrounding country, are real defects in picturesque beauty. No kind of property is less the object of envy, or more grateful to the eye, than to take possession of a country in an extensive view: it contributes to the general beauty, and is equally enjoyed by all, without offence to any. That display of nature is certainly most magnificent, which is bounded only by the horizon: where scenes under the immediate view present the most captivating charms, and where distance harmonizes with the fore-ground.

COW-KEEPING IN SWITZERLAND.—*Continued from p. 50.*

THE district of Innerooden, in the canton of Apenzel, nourishes, during the summer, upwards of 15,000 head of cattle of every description, but a much smaller number during the winter. The meadows do not furnish a sufficient quantity of hay to maintain all the cattle in winter, which, during the summer, find plenty of food in the pastures, and on the Alps in this district. Great numbers of cows, sheep, goats, and pigs, are, therefore, purchased in spring, and sold again in autumn with considerable profit.

The rearing of black cattle is by far the most considerable and most important branch of the rural system of the inhabitants. During the summer, 9000 cows are grazing on the Alps of Innerooden, of which number 6000 only remain in the country for the winter. The cow-keepers in Apenzel find it more profitable to sell their cow-calves to the inhabitants of St. Gall, and other cities, than to rear them. Every spring they purchase in the markets of Bregentz, Hohenembs, Feldkirch, and Pludentz, as many cows as they want, in addition to those which they maintain during the winter, duly to improve their Alps. Independent of their being thus relieved from the care and trouble of bringing up the calves, they also gain more in this manner, as, during the whole summer, they enjoy the milk of the cows thus purchased; and, on selling them again in autumn, they receive as much, nay, frequently more, money, than they paid for them; for the cows return from the Alps in a better condition than they are brought thither in the month of May. Poor Alp-holders, who are not possessed of sufficient money to purchase cows, endeavour to farm some, for the summer, out of the neighbouring Austrian dominions, or the districts of Sargan, Say, and Thurgan; the number of cows thus farmed and pastured on the Alps of Innerooden amounts to from 900 to 1000 head, which are comprised under the 3000 that are every spring brought into the country.

The 9000 cows, which, during 25 weeks, find sufficient pasture on the Alps of Innerooden, yield the most important produce of the country, and which, in every point of view, deserves a more particular notice.

Many cows yield daily from five to six gallons of milk, while they are grazing on the Alps; but the average produce is five and a half gallons a day: a gallon of milk weighs about five pounds one quarter troy weight. Every cow yields, therefore, upon an average, during the 25 weeks of pasture, 950 gallons of milk. Experience has shewn, that the cow keepers, in general, make five pounds of fat or cream-cheese, out of 20 gallons, or 103 pounds, of milk; and one pound of butter, and two pounds of common cheese, (each pound containing 20 ounces,) cut of seven, eight, to nine, gallons of milk, according to its different qualities.—Butter fetches from 15 to 24 kreutzers a pound; the medium price is 18 kreutzers. Common cheese costs four kreutzers; and cream-cheese from eight to nine kreutzers a pound; fifty pounds of cream-cheese are, therefore, equal in value to 18 pounds of butter, or 32 pounds of common cheese, and produce from $7\frac{1}{2}$ to $8\frac{1}{2}$ florins. If the price of fifty pounds of cream-cheese, or of the above quantity of butter and common cheese, rises as high as ten florins, this is thought an uncommon event, which never happens but in times of extraordinary scarcity, such as the year 1785.

From these data it is evident, that the cow-keepers prepare, out of the milk-produce of every cow, during the 25 weeks of pasture, either 262 pounds of cream-cheese, from 40 to 50 florins, or 131 ditto of butter, and 262 ditto common cheese, from 57 to 60 florins.

The Apenzel cow-keepers reap, therefore, more benefit from making butter and common cheese, than from preparing cream-cheese out of the milk of their cows: for this reason, the two former articles are generally manufactured throughout the district of Innerroden, in preference to the latter. The cow-keepers, on boiling the milk, and preparing the cream-cheese, obtain, it is true, a second precipitate, that is, a sort of meagre cheesy substance, which the Swiss call *zieger*; but this is inconsiderable: for, on making 262 pounds cream-cheese, they obtain about 50 pounds *zieger*, which being sold for four kreutzers a pound, fetch only $3\frac{1}{2}$ florins, so that the profit on butter and common cheese exceeds the proceeds of cream-cheese by 10 or 11 florins.

During the hot season, when the milk soon turns sour, the cow-keepers, who graze their cattle on the Alps, make cream-cheese; the whole quantity of milk is not, therefore, applied to the making of butter, and the profit is, of consequence, somewhat lower. The cow-keepers, who make cream-cheese, very seldom sell the *zieger* which they obtain, but smoke and consume it, whereby a considerable saving is made, in regard to bread and other provisions. From these considerations, we incline to think, that the average amount of the produce of 9000 cows, during the summer, with the nearest approximation to truth, may be stated at 460,000 florins.

As to the 6000 cows, which are wintered in the district of Innerroden, each of them yields daily, upon an average, two gallons of milk; and, consequently, during the 25 weeks they are stall-fed, 310 gallons.

When the cow-keepers make cream-cheese or butter, they obtain a large quantity of whey, which is not left unimproved. Every cow-keeper buys, in spring, a number of young pigs, which receive no other drink but whey, which, though it does not make them fat, yet brings them to their full growth, and disposes them to be easily fattened. The profit which accrues to the cow-keeper from the sale of full-grown pigs, which have not cost them a farthing during the whole summer, ought also to be added to the proceeds of the milk, which, however great they may appear from the above calculation, yet do not constitute the whole profits which the cow-keepers derive from their cows. Several thousand calves, many lean bullocks, two years old, and a considerable number of fattened cows and bullocks, are yearly sold and exported from the district of Innerroden; the price of a calf is from five to eight florins, and of a lean bullock, two years old, from seven to twelve Louis d'ors. The skins of the cows and calves, consumed within the district, and the salt-petre, which the inhabitants know how to prepare by means of the urine of this cattle, are also articles which are exported, and may amount to from 70,000 to 80,000 florins a-year. The total amount of the annual proceeds of the cattle, kept and pastured in the district of Innerroden, may, therefore, be estimated at from 602,000 to 660,000 florins. To this sum should be added the produce of the goats and sheep kept by the inhabitants; but, from want of sufficient data on the subject, we are not able to form any just estimate of its amount. Young sheep are bought, in spring, for about two or three florins a-head, and sold again, in autumn, for five florins.

florins. The goats find plenty of wholesome food on such steep and stony places as are inaccessible to black cattle; and, of this milk, large quantities of goat-cheese are made by the inhabitants.

The honey, made by the bees of this pastoral country, is excellent. Common honey is sold for about two florins a gallon; but the best sort, called country-honey, costs from three to four florins: it is of a bright yellow colour, and far exceeds, in flavour, the best honey of this country.

Although the district of Innerooden contains the highest mountains in the cantons of Apenzel, yet it is not sufficiently rich in wood to export any considerable quantity of that article. The open exposure of the mountains towards the north, may, perhaps, obstruct the growth of large forests of pines and larch-trees; yet every district, such as the borough of Apenzel, Gonten, Haslen, Schevendi, Bruellifau, &c. possesses some common forest, equally used by all the housekeepers of the district, under the direction of a forester, appointed by the magistrates, to superintend the use, and prevent the destruction of, the common-wood.

As we are treating here of the articles which the inhabitants of Innerooden sell to the neighbouring countries, we must not omit the snails which are fattened in this district, and exported to Suabia, Bavaria, and Austria. On walking, in summer, along the banks of the Sitter, you meet with small gardens, where such numerous herds of snails are kept, that the noise made by the denticulated jaws of these animals, while they are feeding, may be heard at several paces distance. The young snails are sought after every where, gathered, and put in these gardens, where they are kept and fed until they take to their shells at the approach of winter. In addition to the food which they find on the ground, and on the cherry-trees in the garden, they are fed with salad, cabbage, greens, and other leaves, which food renders them very large and fat. At the approach of Lent, the snail-mongers pack them up in barrels, and proceed with them to the convents in Suabia, Bavaria, and Austria; nay, to Vienna, where they sell them as exquisite dainties, and frequently amass a snug fortune by this trade. The capuchin monks, in the borough of Apenzel, fatten every year a herd of from 40,000 to 80,000 snails for their own use.

Cheese, butter, all sorts of cattle, skins, salt-petre, honey, and snails, form, therefore, the exports of this small country, for which the inhabitants receive, in exchange, such articles as they want for their subsistence. As there exist neither custom-houses nor excise-offices in the district of Innerooden, by the entries in whose registers the exact amount of the exports and imports might be ascertained, we must content ourselves with estimates, founded on such data as may be obtained from other sources. From these it appears, that, adding to the above 600,000 florins the sum of 300,000 florins, for sheep, goats, snails, spun-cotton, and linen, the total amount of the Alp-æconomy, and other industrious pursuits of the inhabitants of the district of Innerooden, may be estimated at 900,000 florins, or about 9000l. sterling: of which sum, however, a small part only remains in the country, the rest going to the neighbouring provinces for salt, wine, all sorts of cloathing, leather, iron, copper, glass, coffee, &c. Under these circumstances, it must be obvious, that the mass of circulating specie cannot but be very small; for the florin of account is only $2\frac{1}{2}$ sterling.

ON DRUNKENNESS.

IT is in general with whole nations, as with individuals; the more noble and generous they are, so much the more moderate are they in the enjoyments of sense; and, on the contrary, the more base and ignoble, so much the more preponderant and unconquerable is their propensity to sensual pleasures of the grosser kinds. One main branch of sensuality is an inclination to intoxicating or stupefying liquors and drugs; and this inclination augments, in whole nations, allowing for some particular exceptions, in equal proportion with the decline of superior mental powers, and the disposition to great virtues and signal exploits. Accordingly, all Slavonian nations have ever been, as in general, more sensual, so also more intemperate in the use of strong liquors, than the Not-Slavonian; and the former are again, in regard to gluttony, beyond all comparison exceeded by the Mongolian nations.

I here pass by the Oriental nations; neither shall I collect together the universal testimony of travellers concerning the gluttony of each particular Slavonian nation, the Poles, the Illyrians, Moldavians, and Wallachians. I confine myself principally to the Russians, because I find the most express and accurate accounts of them in writers of the highest credit, sufficient to convince every one that the gluttony of the other Not-Slavonian nations was never so great as among the common Russians.

When the elder Gmelin was on his travels through Siberia, between the year 1733 and 1743, there happened no religious festival, no civil anniversary, no family entertainment, which was not celebrated by all who assisted at them by a general intoxication. This rage for drinking in the Russians of Siberia, Gmelin knew not how to compare to any thing but a contagious burning fever, that attacked every age, rank, and sex, which, though it had its intervals, soon returned, at stated periods, with equal, or increased, fury. This drinking fever always broke out more violently and universally on the high festivals, and, therefore, also in the Christmas week. From Christmas to the Epiphany, and frequently for a week longer, it was extremely rare to see a person sober. The Siberians were not satisfied with being intoxicated once a-day, but the drinking and the riot continued night and day almost incessantly. During all this time, it was not possible, either by intreaties, or bribes, or by any other means but open violence, to induce artificers and labourers to work; and, when the travellers arrived at any place on this or any the like drinking festival, their soldiers, and the rest of their attendants, notwithstanding all the threats they could employ, got drunk as immoderately and continually as the inhabitants of the place, and they had nothing to do but to wait there in patience till the paroxysm was over. Not only men, but women likewise, frequently drink themselves to death; and it is affirmed by Bruce, that, in what is called the Butter-week, seldom a morning passes in Moscow, but from ten to twelve persons are found dead in the streets, who have fallen down, and been frozen. Of such mortal intoxications we can the less doubt, on reading that a single boor will frequently drink, in one day, brandy to the amount of five rubles, (about 22s. 6d.)

Not less licentious than the Christmas week, were the Butter-week, as it is called, or the week before Lent, the Easter-week, every saint's day, every harvest or threshing feast, every consecration of a church, and all other solemn occasions. Such festivals and solemnities often followed

followed so close on each other, that they were drunk for a whole month together, particularly in October, from one festival to another. At these times, when the Russians of Siberia were once fallen into this rage, it cost them inexpressible efforts to return to their usual way of life, and to be completely drunk only once in about every four days.

The ordinary liquor for this purpose, used by the Russians of Siberia, is bad brandy, and, when this is wanting, a sort of beer, which they frequently render more inebriating by infusing a handful of the *ephedra monostachya*. This herb has the peculiar property of producing such a surprising intoxication, that those who are drunk with it continue singing and capering till they fall down to the ground. When the brandy or the beer is all out, they then guzzle down the dregs, as every thing is of a good taste to them that does but fill.

The viceroy and governor in great towns, and, after their example, the subgovernor and secretary, let no court-holiday, and no namesday or birthday, in their own family, pass unsolemnized. To such festivities, not only the officers, and the higher and lower orders of the clergy, but likewise the most considerable persons in trade, are invited. To the former, the most choice foreign wines are served in abundance; but to the latter, only mead is presented instead of wine, and yet no merchant goes away from table without leaving upon it half a ruble, or a ruble, for the honour of having been feasted at so noble a board, by which custom the expences of the entertainment are greatly diminished. At the tables of the inferior *voivodes*, the brandy is drunk, not out of common wine glasses, but large *stochans* or tumblers, and whoever at such banquets has been the most beastly in his drinking, and in his behaviour, has a rich present sent him the following day. Drunkenness there, at this present day, is so little disgraceful, that it is not taken amiss even in ladies of the best breeding. It is not long ago, that not only common people, but princes and ladies of quality, when sick, would drink whole goblets of brandy instead of the water prescribed them by the physician.

The generality of our readers would scarcely believe, that the Russians can be outdone in drinking by other nations: but they will think quite otherwise when they shall have read the following accounts of the excesses of the negroes and Americans.

All travellers are agreed herein, that, among the negroes, not only men, but also women and children, have an unsurmountable propensity to strong liquors. In Africa, palm-wine, and especially European brandy, and, in the West-Indies, rum, are their favourite drinks. For procuring European brandy, kings sell their subjects, husbands their wives, and parents their children, for slaves to the Europeans. When they have obtained this water of life, or fire-water, as they call it, they seldom leave it till they have seen the end of it. Thus, a negro king continued uninterruptedly drinking for six days and nights, without taking the least food. The negroes usually meet every afternoon in certain public buildings appropriated for that purpose, and fuddle themselves either in brandy, or, for want of it, in palm-wine. When the first calls of thirst are silenced, and the head begins to grow warm, they order the wine to be brought in bottles holding one or two quarts, and continue drinking as long as there is any left. In these drunken carousals, women, and even children of three or four years old, take part, as the capacity of drinking a great deal is esteemed an honourable art. Formerly, the drunkard, who wanted to make a figure,

figure, let two-thirds of the wine run down his beard. If, during their senseless intoxication, they commit murder, or any other act of violence, they, with the utmost composure, take no blame to themselves, but lay the fault on the wine or the brandy.

The Americans, beyond all other nations of their kind, justify the remark, that the slow and stupid savages have never shown greater ingenuity than in the discovery of the art of making inflammatory liquors. There is hardly an eatable fruit, or root, or plant, from which they have not learnt the method of preparing an intoxicating drink; and many of the wildest savages had, previous to the arrival of the Europeans, invented from six to nine several kinds of the strong liquors. The most universal drink of the original Americans, is that which bears the name of *chica*, which, indeed, is prepared a great many different ways, but the most usual is from maize, or Turkish wheat. Some soak the maize in water, even in feculent water. But commonly, it is chewed by old women, and as often by young children, who spit it out altogether into a vessel, where it is left standing till the whole mass has fermented. The Americans give several reasons why the maize is best chewed, and why this mastication should be performed by old women and young children. Namely, they pretend, that it is a common observation, that the *chica* never more perfectly ferments. Even the Europeans accustom themselves to the *chica* prepared in this manner; yet they would take care not to drink it, if a living toad were thrown in, and dissolved in it, as Gage saw done with his own eyes among the Indians of Guianala.

When the Americans have prepared a due quantity of this *chica*, they invite their friends to a jovial drinking-bout. Indeed, there are particular districts where the women abstain from drinking at these scenes of riot, and, when their husbands have had enough, carefully to put them to rest; but, usually, the women and children take part like the men, in these drunken frolics, and the women even give a good dose of *chica* to their children at the breast. When the Americans have once begun to carouse, they observe no bounds, but drink till they fall, bereft of their senses, on the earth. The drunkards resist, with all their might, any attempts to carry them off, and return with a kind of fury to the field of battle: and this, says Ulloa, is not peculiar to Americans of any particular districts, but in this they are every where alike. The most violent vomitings not only do not in the least abate the drunken rage of the Americans, but rather inflame it more: and when they are relieved, and somewhat refreshed by it, they fall to it again with redoubled avidity. Such drinking-bouts last not only three or four days, during which every American drinks as much as would fill a large cask, but, at times, for ten or fifteen days, nay, for three or four months, almost without intermission. When any one falls, there he remains, whether in a heavy shower of rain, or in a morass, or in a heap of filth, 'till he comes to himself, without letting any thing disturb him. When a man feels the heat too excessive, he makes great wounds in his head, in the temples, or the breast, or sticks a knife in the calf of the leg, in order to ease himself a little from the consuming fire by a copious loss of blood. It almost always happens, that some of them die from the excessive draughts they take; and still more frequently that they come to bloody conflicts, in which several are either killed or wounded. All acts of manslaughter and maiming committed in fits of drunkenness, appear to the Americans as perfectly

perfectly innocent, and are never revenged, either by the magistrate, or by the relations, or even by the wounded person himself.

Ever since the American savages have been acquainted with European brandy, or with the rum prepared by the Europeans, their eagerness after intoxication is much increased by a new incentive. They themselves confess, that the fire-water kills them before their time; that it reduces them to poverty; that it undermines their activity and vigour; but they add, that it is impossible for them to abstain from it, and complain of the Europeans for having introduced among them so dangerous and irresistible a liquor. For procuring brandy in South America, they sell all they have, even their wives and children; and, in northern Louisiana, it has often happened, that the most faithful, and, to all appearance, the most sensible, Indians, have murdered their masters at the chase, only for the sake of getting possession of his brandy-bottle. The laborious Indians, who work in the Spanish mines, expend, in a few hours, in rum, the half of the money that is paid them every Sunday; and, in the same manner, the other Americans, women as well as men, throw away all, or the greatest part of, the money they earn, and are, therefore, obliged to put up with the most wretched habitations, the vilest food, and the poorest covering. When they have drunk out their stock of brandy, they beg the Europeans, with tears in their eyes, to give them more bitter water, or demand it with the utmost assurance. In Peru, an Indian drank to the amount of seven pesos, or thirteen bottles of rum, in a very few hours, without feeling any other effects from it but a senseless intoxication. Mr. Adair, unable to free himself from the importunity of an impudent savage for brandy, gave him a large bottle of pepper-water. The American drank of this fiery distillation till he was almost suffocated. He was as little dismayed, however, by these painful effects, as another was after a merry-making, though, from the violent agitation of his stomach and bowels, he fell breathless on the ground. When both had somewhat recovered, they broke out in extravagant praises of the powerful water and the bountiful donor. Another time, Adair was so long persecuted by a savage for brandy, that he was, at last, obliged to give him a quart of the strongest spirit of turpentine. The American presently gulped it down, began to foam at the mouth, and fell senseless to the ground; but was, in a few days, quite recovered by hot-baths and cooling drinks.

Though it is agreed by all travellers, that brandy and the small-pox have committed more ravages in America than the sword of the Europeans, yet it is no less certain, that numberless Americans can be guilty of the most prodigious excesses in drinking, without getting pleurisies, or other sicknesses, the usual attendants on that practice with us. With all their debauches, as Frazer informs us, they will reach to the age of a hundred years; and, without being bald or grey-headed, numbers are seen that are a hundred and twenty, or a hundred and thirty, or even of a greater age.

The foregoing facts are sufficient to convince every one, that the propensity of the negroes and Americans to intoxicating liquors, is of a kind altogether different from the licentiousness, in that respect, of the European nations; and that the former as much exceed the latter in their avidity for inflammatory liquors, as in the capacity of drinking them in such quantities as would infallibly cost any European his life.

ON THE CAUSE OF THE POPULARITY OF NOVELS.

THERE is no species of writing that has been more popular among young readers, since its first appearance, than the *Novel* or *Romance*, and I have not been able to discover a better reason for the high favour in which such compositions are held, than the tameness and insipidity of common life and common events. Tired of this, we first betake ourselves to the page of history, but here, although we occasionally meet with incidents that are surprising, there is, in general, a forbidding gravity and dignity in the style and manner in which they are related; and, for the most part, history is employed on the actions and adventures of heroes, kings, and statesmen, a class of persons with which we are but little acquainted, and in whose success young persons feel but little interest.

Finding, therefore, but scanty amusement in these grave and regular performances, where it is absolutely necessary that nothing should be related but what is true, and no ornaments appended which did not belong to the original fact, we fly for relief from the sameness of real life to the composition called *Novels*. In them we find common things related in an uncommon way, which is precisely the remedy we have been seeking to vary our amusements. Instead, for example, of a young couple walking regularly to church to be married, with their parents' consent, and their parents walking regularly with them, (an incident so common as to occasion little or no notice,) we have a pair of true lovers, concealing from each other what they both are desirous to reveal, thwarted in their affection by cruel fathers and mothers, or guardians, beset with spies, their letters intercepted, rooms turned into prisons; and, if an escape, usually called an elopement, be practicable, windows are turned into doors, and a ladder becomes a staircase; post-horses are furnished with wings, and post-boys, of the true Hounslow-breed, are converted into cupids, while an old battered chaise is an hymeneal car.

It is this art of making much out of little that reconciles us to a course of novel-reading. We find how tame and insipid real life is; we awake in the morning, dress ourselves, go out shopping or visiting, and return, in perfect safety, to the same employments or amusements this day that we returned to yesterday, and which will, probably, engage our time to-morrow. It is not remarkable, therefore, if young and active spirits become tired of a routine so dull and unvarying, and are desirous of adventures which may distinguish them from the common herd of neighbours, and give employment for town-talk. Such are to be found in novels, where, in the morning, the hero or heroine is awaked by the soft melody of a lute under the window, and, immediately upon the window being opened, the sound is lost, and no person appears!—In these worlds of a new creation, if a young lady ventures to walk beyond the limits of her father's domain, she is either seduced by the 'false flattering tongue' of some gay and gallant Lothario, into a post-chaise, or more rudely forced into one by a band of ruffians with masks on their faces, and drawn swords in their hands. Not an hour passes without some incident of this kind, so that, if the real world was like the world of romance, we might say of the metropolis, with a learned justice who has written on the police, 'that there are many thousands in it who, when they get up in the morning, cannot tell what shall befall them in the course of the day, or where they shall sleep

sleep at night.' For such is the ever-varying fate of those who live under the dispensations of a romantic imagination.

It might, however, be worth while to enquire, whether the events of romantic life are capable of being realised without danger and disappointment. We are not quite certain, that youth is to be divided into *three or four volumes*, and, whatever errors or crimes may be committed, to end in a happy marriage and a great fortune in the *last*. Elopements, indeed, have been tried, and they have served to vary the common routine of being asked at church, or married by a licence; but it has not been found, that such marriages have proved more happy than the old-fashioned kind—on the contrary, it has been found, that, after a few months or weeks, the parties have been plunged into a state of life more dull and insipid than before, and which has ended, in more than one recent instance, in certain adventures which have led the parties into a separation as *romantic*, and out of the common way, as the elopement itself. It must, therefore, I am afraid, be concluded, that, however amusing the adventures of novel-personages are, we ought to be very cautious how we attempt to perform them in real life. Our laws, unfortunately, are not composed upon the system of romance, and I know not where a collection of more stern and severe critics can be found than in the courts of king's bench, doctors' commons, and the Old Bailey. The lord chancellor, too, I am sorry to add, is a gentleman of that peculiar way of thinking, as to consider a door the properest part of a house for a young lady to walk out at, a stair-case a more becoming mode of descending than a ladder of ropes, and fathers, mothers, or guardians, the best adepts at explaining or answering the contents of a billet-doux. This may, probably, be owing to his lordship's want of taste, but it is a want of taste that has been very common, among gentlemen learned in the law, for many years.

But, notwithstanding the great pains that have been taken, in many hundred late novels, to give a turn and a variety to love affairs, by every mode of cross-purposes and hair-breadth-escapes, there must be a termination even to these, and the common adventures of novels were actually becoming as insipid as the progress of real life, when a bold and successful attempt was lately made to enliven these narratives by a certain proportion of murders, ghosts, clanking-chains, dead bodies, skeletons, old castles, and damp dungeons. Happily for those who are tired with themselves and all around them, this attempt produced a number of imitations, and we now rarely see a novel that is not entirely composed of the terrific materials above enumerated.

Murder is certainly a very fruitful topic: it can be contrived in so many ways, and, if once we return to the old-fashioned belief in ghosts, it is incredible with what ease we may increase our stock of personages, for every one mentioned in the work may have a ghost, and, living or dead, we may in this way exactly double our amusement. We may truly say, with Macbeth,

—'The times have been,
That, when the brains were out, the man would die,
And there an end: but now, they rise again,
With twenty mortal murders on their crowns,
And push us from our stools.'—

And surely it is no wonder if our timid females are pushed from their stools, in reading the horrid, barbarous, and bloody, murders, that are now served up for their *amusement*.

Amusement! did I say?—Yes, certainly, for their *amusement*. This is the most favourable conjecture; for surely it never could have entered into the brain of any writer of this description, that our lovely females wanted *instruction* how to commit or avoid murders. Amusement it therefore must be, and certainly is amusement of a very singular kind, such as appears to me to be very incompatible with tenderness of frame, or purity of mind. What should we think, if a lady, who had the command of an extensive library, should ransack the indexes, and reject every page but that which contained an account of a murder? A question then very naturally arises, Why are works, entirely composed of murders, considered as most certain of being perused? The answer to this question I shall leave to my readers, and content myself with hoping that the present fashion, like all departures from nature and common sense, will have but a short reign.

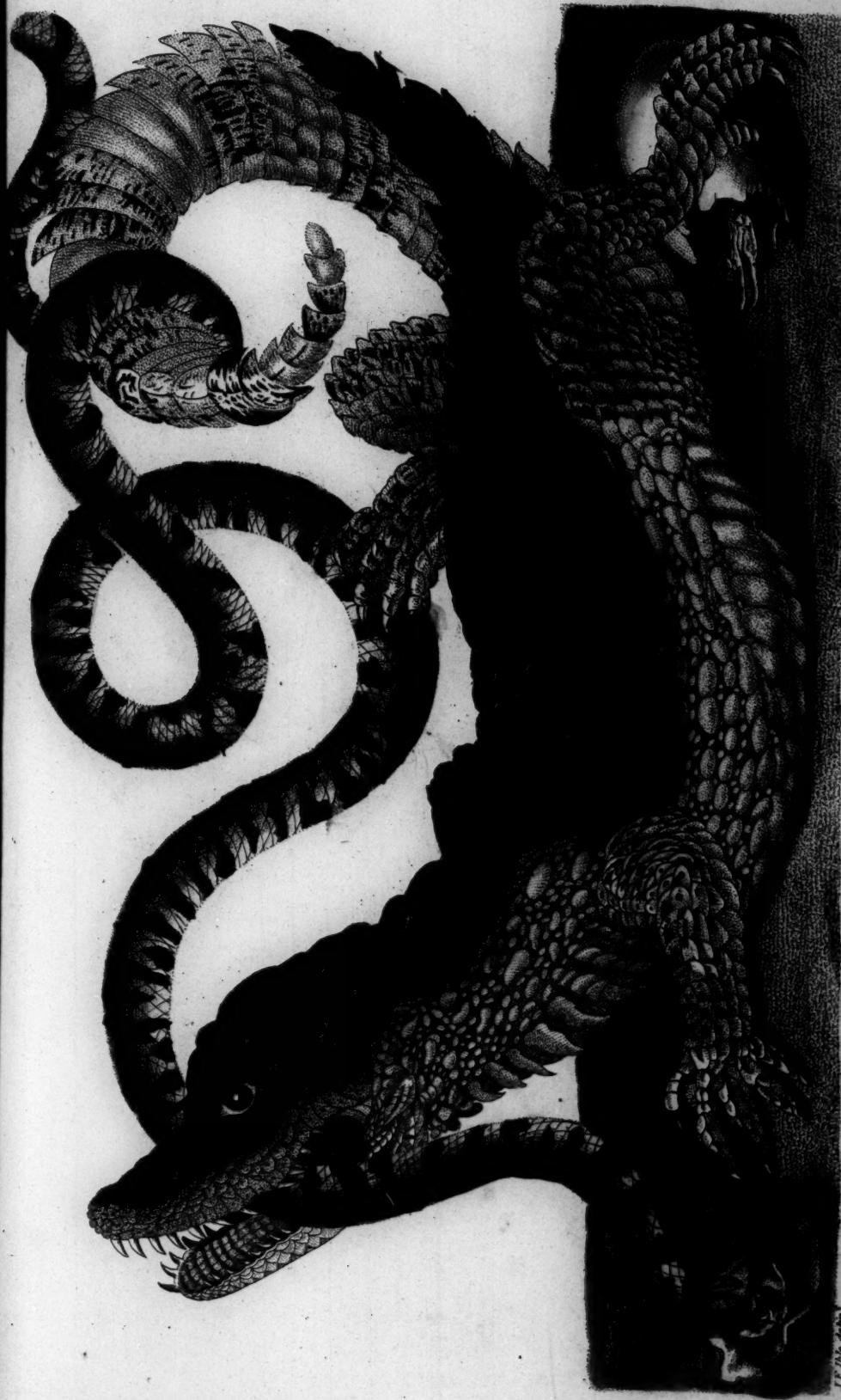
Still must I revert to my original thought, that a mistaken notion of the dulness and sameness of common life so often sends us for relief to the regions of fiction, and, if we go there merely upon the principle of amusement, we shall derive no disadvantage from perusing the most classical productions of this description: but, beyond that, I suspect we shall often be deluded by estimates of human life and happiness that are calculated upon false foundations. The days of youth are certainly days of curiosity, and, if that is directed to proper objects around us, we shall not find that real life is so devoid of variety as we imagined, or that there is any absolute necessity for relieving our minds by fabulous narratives. The page of history, to him whose mind has not been weakened by a course of superficial reading, will contain more variety and entertainment than the utmost stretch of fiction could have produced, and we shall have the superior satisfaction in reflecting, that the instruction we receive is well grounded, and that the events which surprise us are always true, or, at least, probable. Where they are doubtful, the historian's suspicions prevent our being deceived. This, added to an attentive observation of the scenes around us, will store the mind with reflections of an infinite variety, and far greater utility, than are to be derived from the wild narratives of the imagination, and we shall soon be enabled to conclude, upon the surest grounds, that he, to whom real life appears dull, must himself be a man of dull capacity.

TO PREVENT MOULDINESS IN INK.

MR. EDITOR, This is to inform your correspondent, L. D. junior, (page 329,) that I have tried two things for the prevention of ink's moulding. First, by adding a small quantity of brandy, which, in some measure, succeeded to my wish; but am apprehensive injures the colour. Second, by putting some salt to it, which never fails me; in what proportion, my experiments have not yet determined; but am led to imagine about one ounce sufficient for a quart of ink. If, upon trial, this should be found to succeed with L. D. could with he would let the writer of this know, through the medium of the **BRITANNIC MAGAZINE**; as he learns the miscellaneous department of this is about to close.

T. FORD.

END OF THE FIFTH VOLUME.



The Cayman, Crocodile, and Amphisbena Viper.

J.E. Dale delin.

L. P. G. Sculp.





THE AFRICAN LAND TORTOISE.

Published as the Act directs by J. Wilkes, March 1838.

Edwards delin.

Barlow sculp.

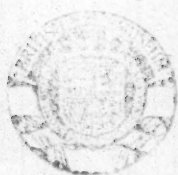




The Great Locust from the Bay of Honduras.

Published Jan^r 1789.

J. Tassoni del.





The PROGRESSIVE GENERATION *of the* LANTHORN FLY.

Published as the Act directs Nov. 6. 1793 by R. Dilly.

Barlow sculp.

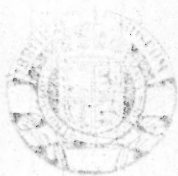




The Lantern-Fly in its Luminous State.

Barlow sculp.

Published as the Act directs, Jan^y 6 1795, by R. Dilly.





The Great American Spider, which prey on Birds.

Page. 100

Published as the Act directs, July 1st 1794. by E. Sibly.

W. del.





1. The Goliath, 2 and 3. The Carnifex, 4. The Sulcated, and 5. The Carolina Beetle.

Published Sept. 1. 1800.

J. T. Smith sculp.

